Service Manual

AV8

Issue 2.0

FMJ AV8
Preamp Processor



ARCAM

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Manual Updates

Service Manual changes issue 1.0 to 2.0

L896 Digital Board

02_E101	IC906 EEPROM changed from 5G24LC08 to 5G24LC16
	Parts list updated to issue 1.3
02_E127	R803 removed from parts list
02_E160	R921 changed from 10K 0805 1% (1M310) to 33K 0805 1% (1M333)
02_E161	IC907 changed from 74HC14 (5K7414) to 74LVC14 (5KLVC14)
	IC803 changed from CS8415A-CZ (5A8415) to CS8415A-CR (5A8415R)
	R820 changed from 5K1 (1M251) to 1K2 (1M212)
	C820 changed from 82N (2J382) to 100N (2J410)
	C821 changed from 2N2 (2J222) to 4N7 (2JA247)
	Circuit plus parts list updated to issue1.6

L897 Power Supply Board

02_E090	Vias added to connect chassis planes between top and bottom layers
	Plating removed from holes of PSU heat sink HS3
	On mechanical parts list for E918RS 1xHA3V06A removed and 1xHA3V10B added
02_E094	1xHA3V06A deleted
	1xHA3V10A added for MOSFET clip
	1x F224 removed
	Parts list updated to issue 3.1
02_E142	R1 removed
	Opto added HCNW137
	Circuit plus parts list updated to issue 4.0
	PCB changed to allow wider opto to be fitted
	Parts list updated to issue 4.1

L898 Display Board

02_E081	R128 changed from 22K (1M322) to 33K (1M333)
	arts list updated to issue1.2

L922 Video Board

02_E103	Change of PCB routing
	Circuit plus parts list updated to issue 3.0
02_E112	R431 and R430 changed from 4K7 (1M247) to 470R (1M147)
	Circuit plus parts list updated to issue 3.1

L948 Phase Locked Loop Board

02_E100	Circuit plus parts list updated to issue 1.0 for production release

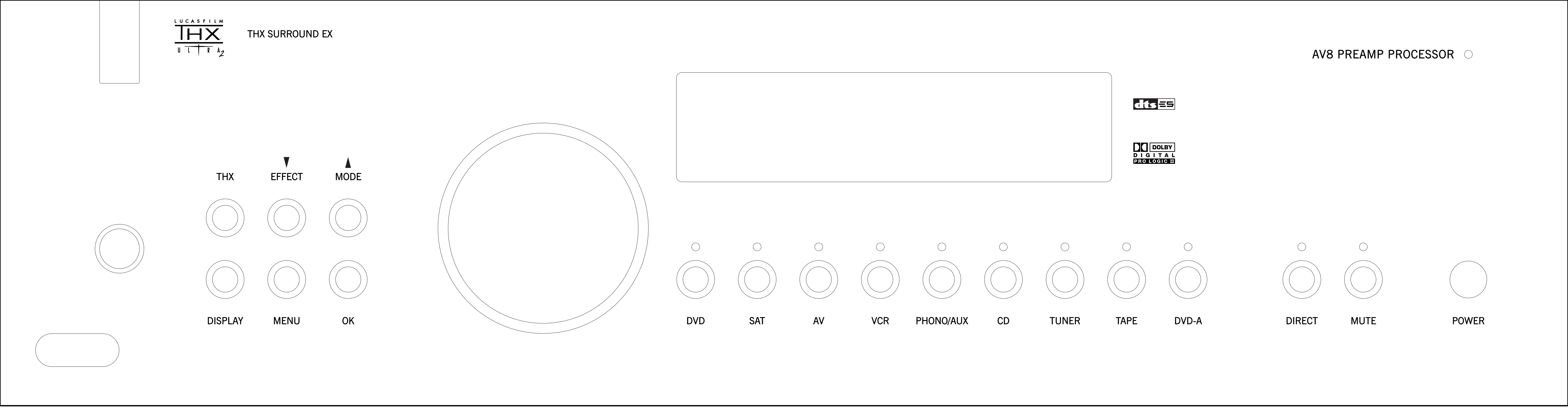
Summary — Issue 1.0 to 2.0

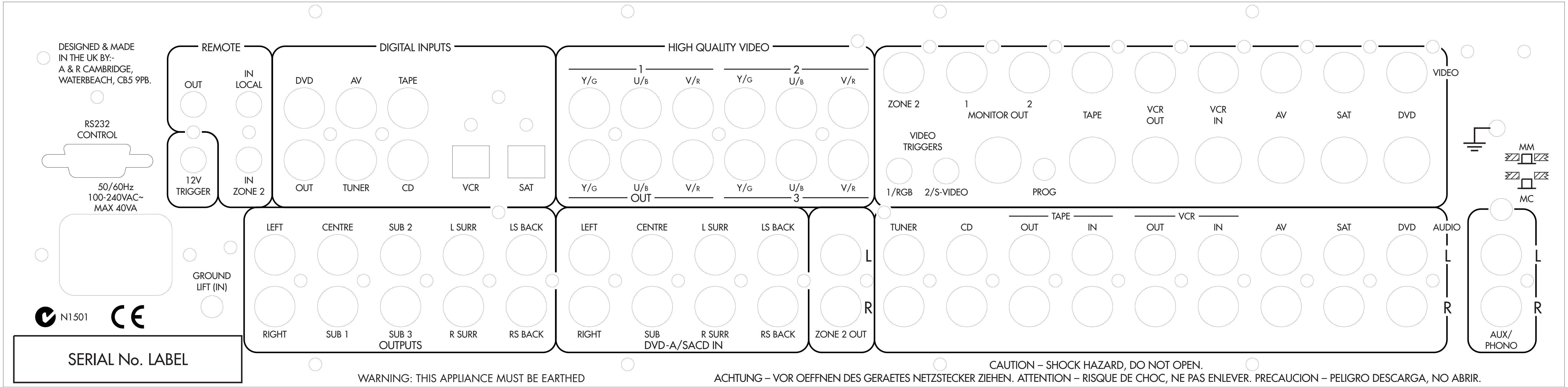
Update	New section added
Technical Specification	Specification included
Service Guide	Engineering mode updated
	AV8 programmer software added
	AV8 Loader software added
Build Sequence	Layout changes to manual
	Figure 3 changed (F224 blanking plug removed)
	Figure 8 changed (E042AY replaced with E876MC)
	Figure 12 changed (note for blanking plug removed)
Digital Board L896	Updated circuit diagrams and parts list issue 1.2 to 1.6
Power Supply L897	Updated circuit diagrams to issue 4.0 and parts list issue to 4.1
Display Board L898	Updated parts list issue 1.1 to 1.2
Audio Board L921	Circuit plus parts list updated from 1.1 to 1.2
Video Board L922	Updated circuit diagrams and parts list issue 2.0 to 3.2
Phase Looked Loop L948	Updated circuit diagrams and parts list issue B to 1.0

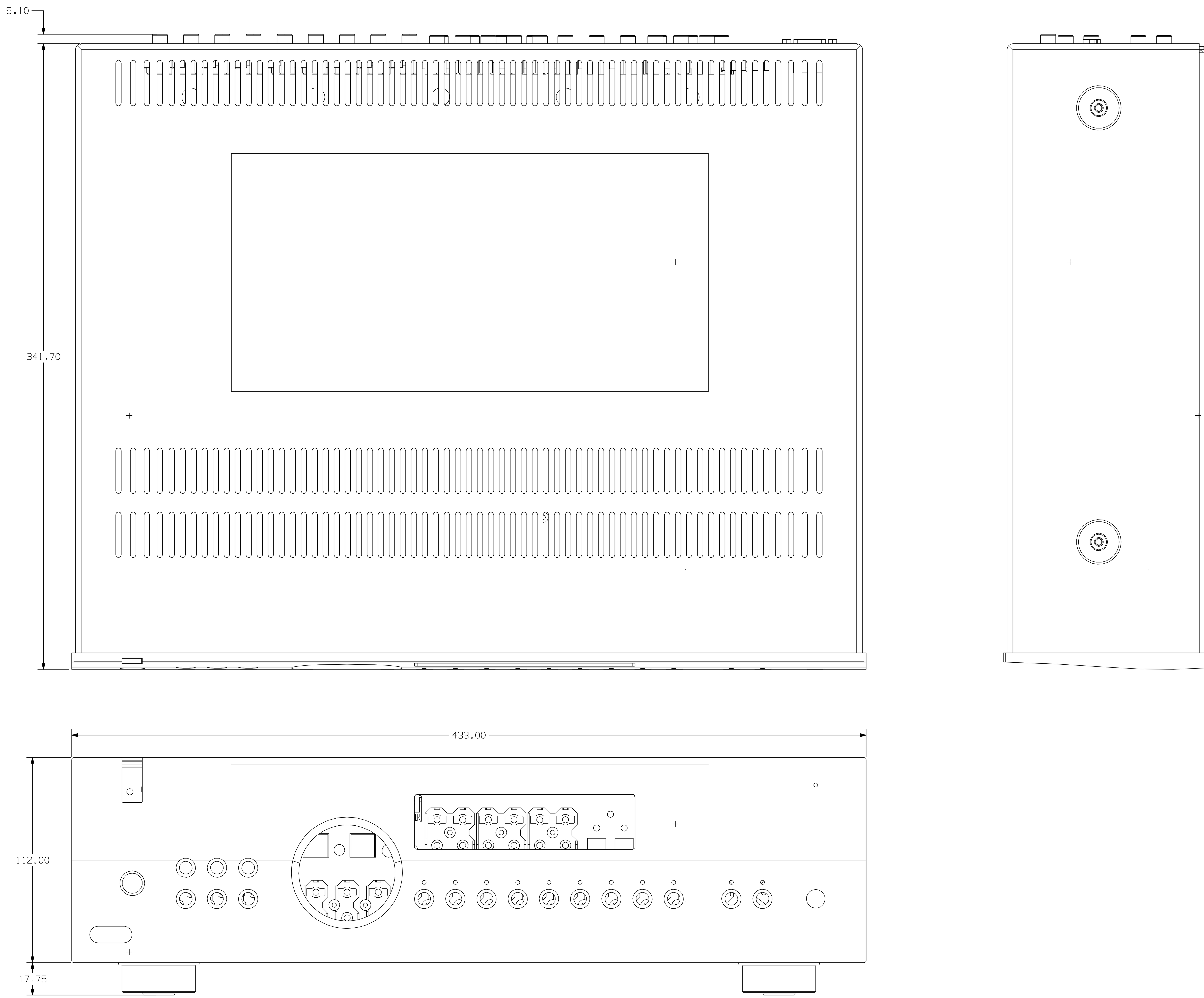
Technical Specifications

Contents

- Front & rear view diagram
- Dimensions diagram
- Specifications


THX SURROUND EX
AV8 PREAMP PROCESSOR
THX
EFFECT
MODE
DISPLAY
MENU
OK
DVD
SAT
AV
VCR
PHONO/AUX
CD
TUNER
TAPE
DVD-A
DIRECT
MUTE
POWER


DESIGNED & MADE
IN THE UK BY:-
A & R CAMBRIDGE,
WATERBEACH, CB5 9PB.
RS232
CONTROL
50/60Hz
100-240VAC~
MAX 40VA
N1501
SERIAL No. LABEL
REMOTE
OUT
IN
LOCAL
12V
TRIGGER
IN
ZONE 2
GROUND
LIFT (IN)
DIGITAL INPUTS
DVD
AV
TAPE
OUT
TUNER
CD
VCR
SAT
HIGH QUALITY VIDEO
1
2
Y/G
U/B
V/R
OUT
3
VIDEO
ZONE 2
1
2
MONITOR OUT
TAPE
VCR
OUT
VCR
IN
AV
SAT
DVD
VIDEO
TRIGGERS
1/RGB
2/S-VIDEO
PROG
MM
MC
LEFT
CENTRE
SUB 2
L SURR
LS BACK
RIGHT
SUB 1
SUB 3
R SURR
RS BACK
OUTPUTS
LEFT
CENTRE
L SURR
LS BACK
RIGHT
SUB
R SURR
RS BACK
DVD-A/SACD IN
L
R
ZONE 2 OUT
TUNER
CD
TAPE
OUT
IN
VCR
OUT
IN
AV
SAT
DVD
AUDIO
L
R
AUX/
PHONO
WARNING: THIS APPLIANCE MUST BE EARTHED
CAUTION – SHOCK HAZARD, DO NOT OPEN.
ACHTUNG – VOR OEFFNEN DES GERAETES NETZSTECKER ZIEHEN. ATTENTION – RISQUE DE CHOC, NE PAS ENLEVER. PRECAUCION – PELIGRO DESCARGA, NO ABRIR.


5.10
341.70
433.00
112.00
17.75

Technical Specifications

Audio

Line input sensitivity (set to Reference)	2V rms
Input impedance	10k ohm
Preamp output level (nominal)	2V rms
Output impedance	25 ohm
Signal/noise ratio (unwtd 20Hz –20kHz)– analogue	>100dB
Signal/noise ratio (unwtd 20Hz –20kHz)– digital (24-bit)	>98dB
THD+N – analogue	0.0012%
THD+N – digital (24-bit)	0.0015%
Headphone maximum output level into 600 ohm	5V p-p
Output impedance	5 ohm

Video inputs and outputs

Input and output impedance	75 ohm
Composite video level	1V
HF response to (–3dB)	12MHz
S-video level (Y/C)	1V/0.28V
HF response to (–3dB)	12MHz
HQ (component) video	
level (Y/Cr/Cb)	1V/0.5V/0.5V
level (R/G/B)	1V/1V/1V
HF response to (–3dB)	300MHz

Digital inputs

Coaxial connection (level/impedance)	0.5V/75 ohm
Acceptable sampling frequencies, all inputs	44.1kHz, 48kHz, (96kHz stereo only)
Digital output	
Output level/impedance	0.5V/75 ohm
Sampling frequency in ADC output mode	44.1kHz
Trigger outputs	
Output D.C. voltage (excl. RGB status)	12V ±1V
Allowable load	30mA max (min 400 ohm)
Remote inputs and output	
Signal	modulated 36kHz carrier
Coding	Philips RC-5

General

Mains voltage range	85V to 265V
Power consumption	35VA
Power consumption (standby)	32VA
Dimensions Width x Depth x Height (including feet)	433mm x 360mm x 130mm
Weight (net)	9kg
Weight (packed)	14kg
Supplied accessories	Mains lead CR80 remote control 2 x AAA batteries

Service Guide

Contents

- Engineering mode
- AV8 Programmer software
- AV8 Loader software

AV8 Engineering Mode

To access the software versions simultaneously **press OK, DVD & CD** on the front panel.

The software versions will be displayed on the OSD.

AV8 Version: 2.0	
THX Ul2: 13.0	*DTS –ES: 15.0*
Dolby D: 16.0	*DTSNeo6: 18.0*
Plogic 2 : 4.0	*Cos Eff : 15.0*
Exit this menu	

Select EXIT and OK to leave the menu.

If no buttons have been pressed for 30 seconds the AV8 will automatically exit the menu.

Press THX, this takes you to the engineering menu first page.

Use the up/down buttons on the front panel to select the option followed by the volume control to adjust the setting.

Engineering Menu		
RC5 Code Zone 1 :	*16**	*(or 19)*
RC5 Code Zone 2 :	*16**	*(or 19)*
Scrolling Message:	*Off*	*(or On)*
Restore Defaults:	*No*	*(or Yes)*
Diagnostics :	*Off*	*(or On)*
Front Panel IR Rx :	*On*	*(or Off)*
EXIT		

RC5 Code Zone 1
This allows you to select which RC5 system code zone 1 responds to (16 or 19). If set to code 19 the AV8 will not respond to the CR80 remote control.

RC5 Code Zone 2
This allows you to select which RC5 system code zone 2 responds to (16 or 19).

Scrolling Message
This allows you to turn the display scrolling message on/off. When the messages are turned on you can select the displayed message by pressing the corresponding input button.

Button	Message
DVD	Arcam AV8 FMJ Home Theatre
SAT	AV8 Multichannel Processor
AV	arcam sideways
VCR	Arcam AV8 Sound and Vision
AUX	AV8 Designed in Cambridge UK
CD	Arcam AV8 Preamp Processor
TUNER	AV8 THX ULTRA 2, DTS ES, DOLBY PL2

Restore Defaults
This allows you to reset the AV8 to the factory default settings.

Diagnostics (For factory diagnostics only)
This switches on RS232 messaging to allow remote analysis (hyperterminal at 38400 baud, 8 data bits, no parity, 1 stop bit and no flow control).
Please note that this will disable the RS232 interface for user control via crestron or similar controllers.

Front Panel IR Rx
This allows you to disable the front panel IR receiver and prevent the AV8 from responding to these signals.

With the ***Engineering Menu*** title bar highlighted use the volume control to select the second engineering page.

Engineering Menu 2		
	PLL Module	
DVD :	*AUTO*	*(or OFF)*
SAT :	*AUTO*	*(or OFF)*
AV :	*AUTO*	*(or OFF)*
VCR :	*AUTO*	*(or OFF)*
AUX :	*AUTO*	*(or OFF)*
CD :	*AUTO*	*(or OFF)*
TUNER :	*AUTO*	*(or OFF)*
TAPE :	*AUTO*	*(or OFF)*
EXIT		

If the source equipment clock rates are operating outside the specification of the AV8 phase locked loop circuit you may experience “a hissing noise” from the audio outputs. In this situation it is advisable to switch the phase locked loop circuit off of the input giving the problem. Using the second page of the **engineering menu** select the input and turn the PLL (phase locked loop) from AUTO to Off.
This can happen with Broadcast signals particularly from satellite, cable or terrestrial digital TV.

AV8 Programmer

Future software upgrades can be installed via the RS232 port on the back of the AV8. The following equipment will be required:

- IBM PC compatible computer running Windows 98 or later
- Software – ARCAM AV8 Programmer utility (included on the AV8 CD-ROM)
- Lead – RS232 9-way female D type to 9-way female D type (null modem)

Installation procedure

The AV8 Programmer utility needs to be installed on your PC before you can use it:

- Close down any programs which are running, then insert the CD-ROM into the CD drive
- The setup program normally starts up automatically when the disc is inserted. If this does not happen, you can instruct the PC to install the program as follows:
  - Click on 'Start' and select 'Run…' from the pop-up menu
  - In the box, type 'D:\setup.exe', where 'D' is your CD-ROM drive
  - Click 'OK'

The install process will then begin. You will be prompted for your Name, Organization and Destination Folder for the installation (default is C:\Program Files\Arcam\AV8 Programmer\). Follow the instructions on-screen.

Operation procedure

- Open the AV8 Programmer utility by double clicking the desktop icon, or from the Programs list within the Start menu
- Switch off all the power amps connected to the AV8
- Switch off the AV8
- Connect the RS232 lead from the PC to the RS232 control port on the AV8
- From within the AV8 Programmer software:
  - Select the new software file to be uploaded using the 'Open file' button
  - Select the Com port you are using
- Put the AV8 into program mode:
  - Press and hold the program button on the back of the AV8 (located with the video output connections)
  - Turn the AV8 on with the program button still pressed
  - Wait 5 seconds and then release the program button. The display will remain completely blank and no LEDs will light.
- From within the AV8 Programmer software:
  - Click 'Program'

The PC will now upload the software and display the following information:

Connecting:	0 to 100%
Programming:	0 to 100%
Verifying:	0 to 100%

This process will take up to four minutes. When the software has been uploaded the message 'Status: SUCCESS' will be displayed.

- Turn the AV8 off and unplug the RS232 lead
- Wait 10 seconds before turning the AV8 back on

If, after programming the AV8 the unit displays "Populating EEPROM" when first turned on, it will be necessary to reset the user configurations within the unit. This is dependent on the degree of the software changes and will not always be necessary.

AV8 Loader (Preset Backup)

The AV8 Loader utility allows the unit settings to be either downloaded from or uploaded to the AV8. The following equipment will be required:

- IBM PC compatible computer running Windows 98 or later
- Software – ARCAM AV8 Loader utility (included on the AV8 CD-ROM)
- Lead – RS232 9-way female D type to 9-way female D type (null modem)

Installation procedure

The AV8 Loader utility can be run directly from the CD-ROM, or you can copy the entire 'Preset Backup Utility' folder to your hard drive (e.g. C:\ Program Files \ Arcam \ Preset Backup Utility).

Operation procedure

To run the AV8 Loader program:

- Connect the RS232 lead from the PC to the RS232 control connector on the AV8
- Switch off all the power amps connected to the AV8
- Run the AV8 Loader program:
  - Click on 'Start' and select 'Run…' from the pop-up menu
  - In the box, type 'D:\ Preset Backup Utility \ AV8Loader_GUI.exe' or the location of the file on the hard drive if not using the CD-ROM
  - Click 'OK'
- Select the Com port you are using:
  - Select 'File -> Settings…'
  - Select the Com port you are using from the drop down menu
  - Close the window

To download the settings from the AV8 to the PC:

- Create a new backup file:
  - Select 'File -> New…'
  - Locate a suitable place to save the backup file (e.g. C:\ Program Files \ Arcam \)
  - Enter a name for the file in the 'File name' box (e.g. AV8.epr). Note the '.epr' name extension
  - Click 'Save'
- Download the AV8 settings:
  - Select 'Transfer -> Download From AV8…'

The AV8 Loader utility will then download the configuration from the AV8 and save it using the filename you gave. Once the setup is read from the AV8 it is automatically stored as a "working file".

To upload a configuration to the AV8 from the PC:

- Locate the backup file you wish to upload:
  - Select 'File -> Open…'
  - Locate the folder where the backup file is saved
  - Select the name of the '.epr' file you wish to upload
  - Click 'Open'
- Upload the AV8 settings:
  - Select 'Transfer -> Upload To AV8…'

The AV8 automatically resets after the configuration has been uploaded.

Build Sequence

Contents

- **How to assemble the AV8**

1. Assemble the damping plate to chassis floor. Screw through from underneath the chassis and thoroughly degrease the chassis floor before assembling the damping plate. See FIG1.

Part No.	Description	Qty
E816CH	Chassis	1
E873MC	Damping Plate	1
HE6V06B	Self-tapping No6x6mm Pan Torx-Slot Steel Zinc-Plate Black	4

2. Assemble the feet to the chassis. Screw through the chassis floor into the foot. Stick the bumpon foot onto the base of turned foot. See FIG2.

Part No.	Description	Qty
E935MC	Turned Foot	4
HA3V06A	Screw Machine M3x6mm Pan Torx Steel Zinc-Plate Clear	8
F225	Black 'Bumpon' Foot	4

3. Assemble the power socket to rear panel before assembling the rear panel to the chassis. See FIG3.

Part No.	Description	Qty
E040AY	Rear Panel Assembly	1
8A016	8A016 IEC Inlet with EMI Filter YB10T1	1
HA3V10B	Screw Machine M3x10mm Pan Torx-Slot Steel Zinc-Plate Black	2
HJ3A00F	Nut Nyloc M3 Steel Zinc-Plate Clear	2
HL3IB	Washer Internal Shakeproof M3 Steel Zinc-Plate Black	2

4. Assemble power loom to IEC power inlet before assembling the rear panel to the chassis. The live connection is the right hand spade as viewed from behind (spade terminals) with the earth spade at the top.

Part No.	Description	Qty
L939CA	AV8 power loom	1

5. **N.B**. If a phono card is to be fitted then you do not fit the "Aux" snap-off board at this stage, move to step 6. See step 23 for fitting the Phono upgrade kit.

Fit the "Aux" input snap-off board (snap-off from Audio board, L921AY) to the rear panel before assembling the rear panel to the chassis. See FIG4.

Part No.	Description	Qty
HF4V09B	Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black	1

6. Assemble 5x H038 to audio board, L921AY, using 5x HA3V06A in the holes running along the EMC can, only then fit the board into the chassis with the other 5x H039 pillars (do not fit rear panel). Loosely screw all the pillars through the pcb into the chassis, once these pillars are in place tighten them all.
See FIG5.

Part No.	Description	Qty
HF4V09B	*Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black (into EMC shield)*	*3*
H038	38 ff pillars	5
H039	38 mf pillars	5
HA3V06A	Screw Machine M3x6mm Pan Torx Steel Zinc-Plate Clear (from underneath)	5
HF4V09B	*Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black (into sockets)*	*19*

NB. Screws in italics are to be used when rear panel is fitted in step 18.

7. Once the audio board is in place, fit the following cables to the audio board. Ensure the cables, especially the flex foil, are the correct way round.

Part No.	Description	Reference	Qty
L925CA	8-way AMP CT from audio to snap-off 280mm	SK901	1
L927CA	6-way AMP CT from audio to horiz power 100mm	SK801	1
L930CA	5-way AMP CT from headphone to audio 250mm	SK917	1
L922CA	22-way foil cable from digital to audio 100mm	SK916	1
L933CA	5-way AMP CT from digital to audio 100mm	SK915	1
L923CA	8-way AMP CT from digital to audio 120mm	SK913	1
L923CA	8-way AMP CT from digital to audio 120mm	SK914	1

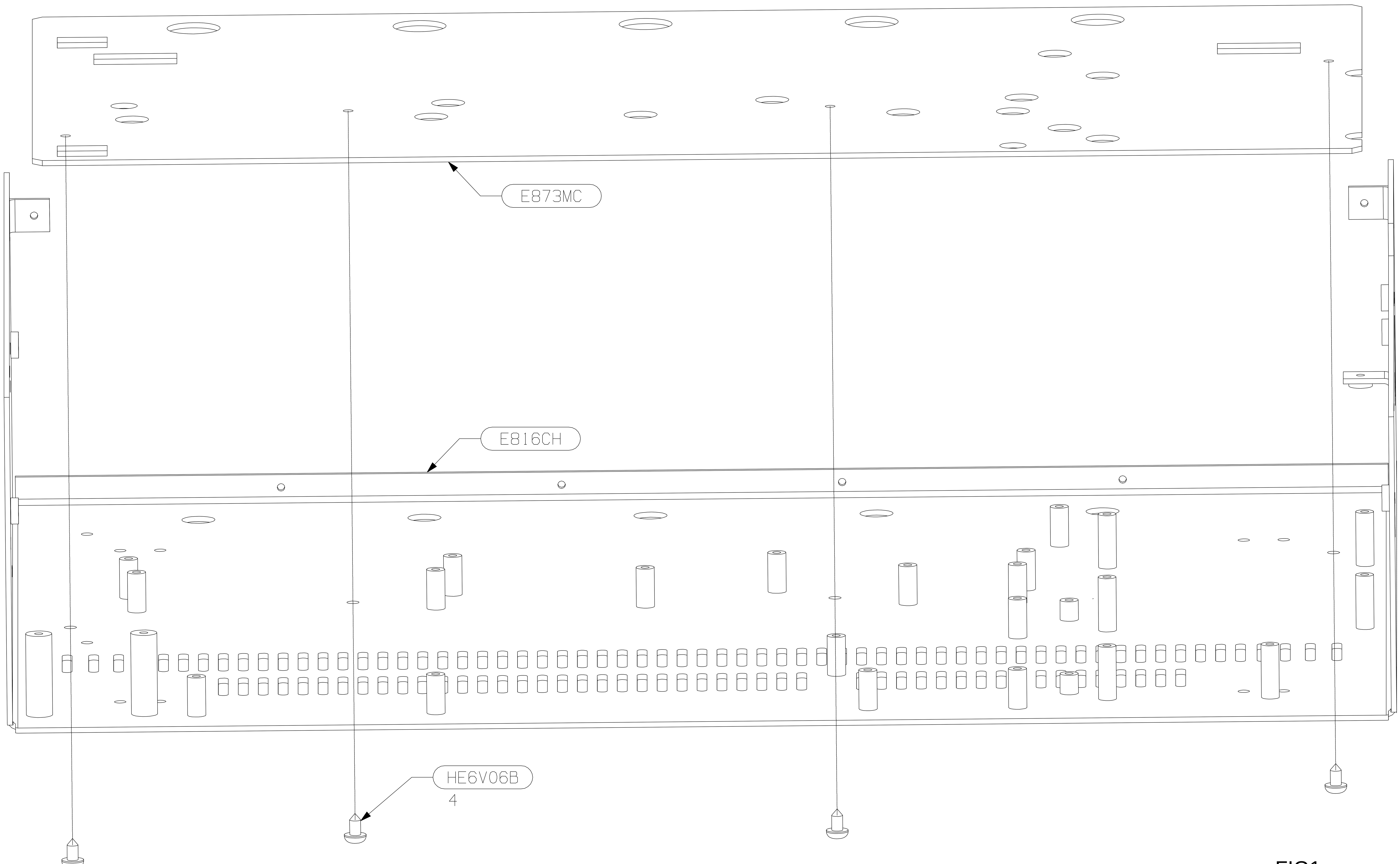


FIG1


FIG2


FIG3

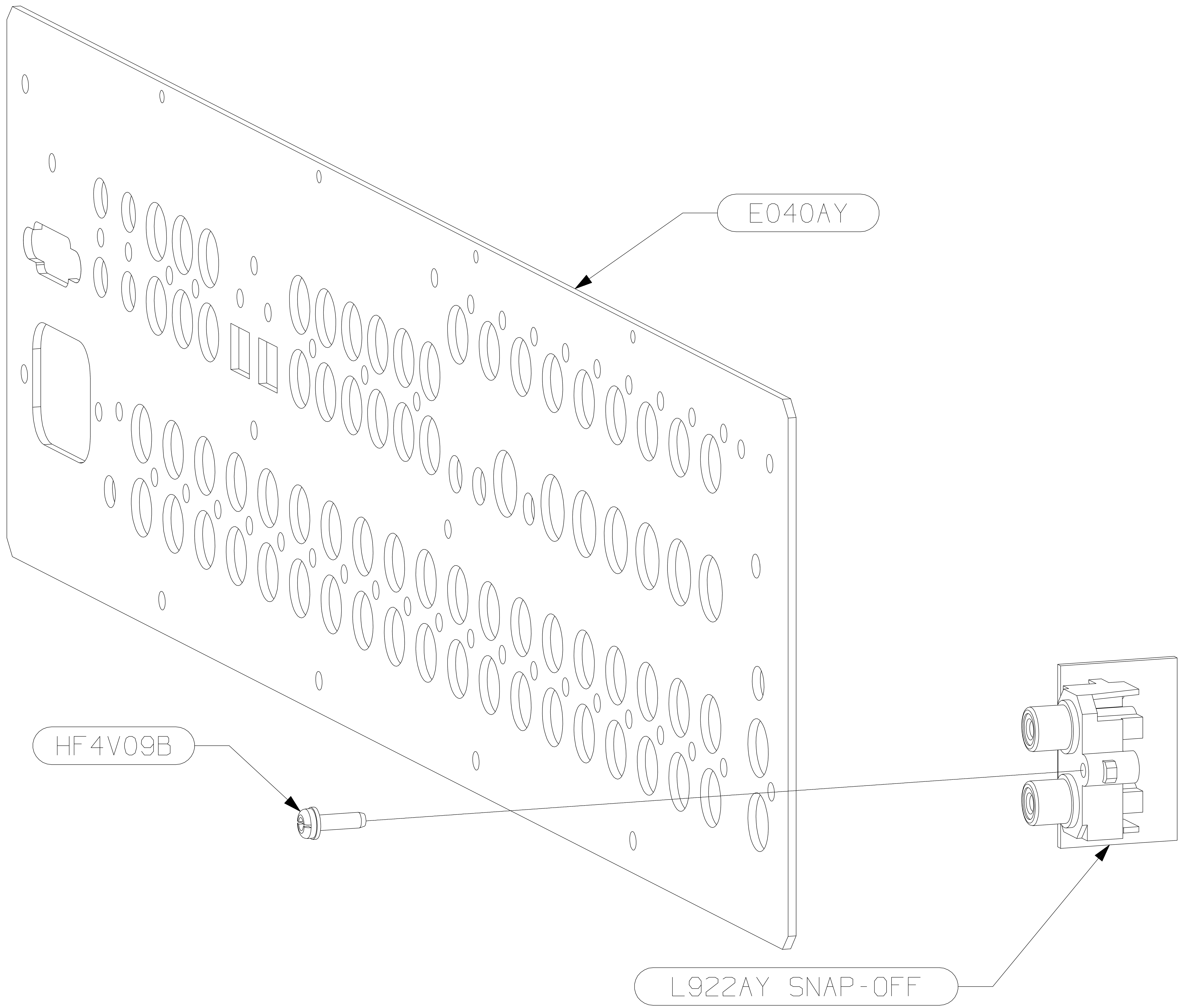


FIG4


FIG5

8. Fit the video board (L922AY – main board) to the chassis (do not fit rear panel yet). Ensure the board is pushed to the back of the chassis before tightening down the board. Use the H041 pillars in the two holes closest to the S-video connectors (right hand side nearest the EMC screen as viewed from the connector side). See FIG6.

Part No.	Description	Qty
HF4V09B	*Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black (into EMC shield)*	*2*
H041	22 mf pillars	2
HA3V06A	Screw Machine M3x6mm Pan Torx Steel Zinc-Plate Clear thro' video PCB into standoffs	9
HF4V09B	*Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black (thro' RP into sockets)*	*9*

Once the video board is in place, fit the following cables to the video board:

Part No.	Description	Reference	Qty
L922CA	22-way foil cable from top video to video 100mm	SK700	1
L925CA	8-way AMP CT from video to horiz power 280mm	SK1000	1
L931CA	30-way foil cable from digital to video 190mm	SK702	1

9. Fit the top video board (L922AY – sub board) to chassis (do not fit rear panel). See FIG7.

Part No.	Description	Qty
HF4V09B	*Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black (into EMC shield)*	*1*
HA3V06A	Screw Machine M3x6mm Pan Torx Steel Zinc-Plate Clear through top video PCB into standoffs	2
HF4V09B	*Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black (thro' RP into sockets)*	*9*

Connect L922CA from the video board (SK700) to the top-video board (SK209)

10. Fit the power can using 2x HA3V06A into standoffs. See FIG8.

Part No.	Description	Qty
E876MC	Power Can	1
HA3V06A	Screw Machine M3x6mm Pan Torx Steel Zinc-Plate Clear into standoffs	2

11. Fit the horizontal power PCB (L897AY – snap-off part 2) using 6x HA3V06A screws into standoffs. Refer to FIG8. Once the pcb is in place, fit the cables below.

Part No.	Description	Reference	Qty
HA3V06A	Screw Machine M3x6mm Pan Torx Steel Zinc-Plate Clear into standoffs		6
L925CA	8-way AMP CT from horiz power to digital 280mm	SK5	1
L926CA	7-way AMP CT from horiz power to digital 350mm	SK7	1
L928CA	6-way AMP CT from horiz power to digital 540mm	SK2	1
L925CA	8-way AMP CT from horiz power to phase lock loop 280mm	SK4	1

Connect the following cables using the reference table below:

Part No.	From	To
L927CA	Audio / SK801	Horizontal power / SK3
L925CA	Video / SK1000	Horizontal power / SK5

N.B. The Video cable L925CA has an excess of length so that the video board may be removed but still remain connected when the unit is serviced. A cable tie should be used to hold this excess when the board is installed.

12. Fit the mains power button to the power switch, with the button to the top. Refer to FIG8.

Part No.	Description	Qty
E887PM	DiVA power button adapter	1
E850PM	FMJ mains button (silver)	1
E850PMB	FMJ mains button (black)	

13. Fit the vertical power PCB. Once the pcb is in place, fit the cable specified below.

Part No.	Description	Reference	Qty
HA3V06A	Screw Machine M3x6mm Pan Torx Steel Zinc-Plate Clear into standoffs		2
L929CA	4-way AMP CT from digital to vertical power 220mm	SK8	1

14. Fit the headphone PCB (snap-off from video board). Fit with socket facing to the front. Refer to FIG8.

Part No.	Description	Qty
HA3V06A	Screw Machine M3x6mm Pan Torx Steel Zinc-Plate Clear into standoffs	2

Connect L930CA from audio board (SK917) to the headphone board (SKP1).


FIG6


FIG7

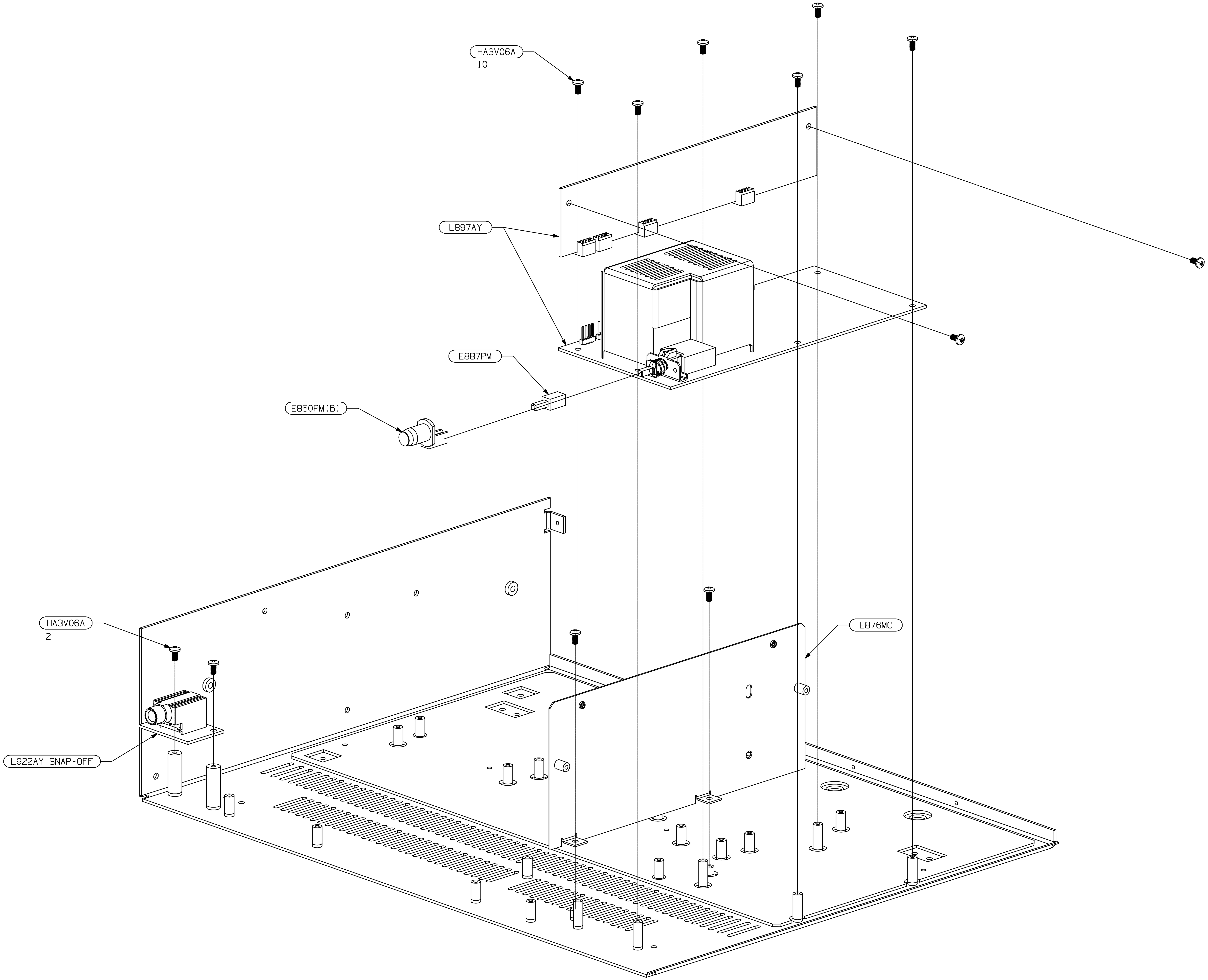

HA3V06A
10
L897AY
E887PM
E850PM(B)
HA3V06A
2
E876MC
L922AY SNAP-OFF

FIG8

15. Fit the digital PCB (L896AY) such that the notch in the board is by the headphone board. Once the pcb is in place, fit the cables below. See FIG9.

Part No.	Description	Reference	Qty
H039	M3x38mm mf pillars into standoffs		7
H030	M3x18mm mf pillars into standoffs		4
L931CA	30-way foil cable from digital to display 190mm	SK901	1
L923CA	8-way AMP CT from digital to phase lock loop 120mm	SK903	1
L933CA	5-way AMP CT from digital to phase lock loop 100mm	SK801	1

Connect the cable assemblies listed below.

Part No.	From	To
L923CA	Audio / SK914	Digital / SK102
L923CA	Audio / SK913	Digital / SK103
L933CA	Audio / SK915	Digital / SK100
L922CA	Audio / SK916	Digital / SK902
L931CA	Video / SK702	Digital / SK900
L929CA	Vertical Power / SK8	Digital / SK1002
L925CA	Horizontal Power / SK6	Digital / SK1001
L926CA	Horizontal Power / SK7	Digital / SK1003
L928CA	Horizontal Power / SK2	Digital / SK1000

16. Fit the phase lock loop PCB (L948AY). See FIG9.

Part No.	Description	Qty
H030	M3x18mm mf pillars into standoffs	4

Connect the cable assemblies listed below.

Part No.	From	To
L923CA	Digital / SK903	Phase lock loop / SK1
L933CA	Digital / SK801	Phase lock loop / SK3
L925CA	Horizontal Power / SK4	Phase lock loop / SK2

17. Clip 2 F219 cable clips into top of EMC shield. Then using the cable clips as handles fit EMC digital PCB shield. Refer to FIG9.

Part No.	Description	Qty
E919MC	Digital EMC Shield	1
HA3V06A	Screw Machine M3x6mm Pan Torx Steel Zinc-Plate Clear into standoffs thro' EMC shield into pillars	11
F219	Twist Lock cable clip	2

18. Assemble the rear panel to the chassis using all the screws in *italics* on previous pages. Fit the power can lid over the chassis and the vertical can wall with vents directly above the EMC can on the power board. See FIG10.

Part No.	Description	Qty
HF4V09B	Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black (rear chassis return)	6
E877MC	Power Can Lid	1
HF4V09B	Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black (2 into power can wall and 2 into chassis wall)	4

Connect the cable assemblies listed below.

Part No.	From	To
L939CA	IEC Inlet	Horizontal Power / SK1
L925CA	Audio / SK901	Aux snap-off / SK927

19. Assemble the phono can assembly to the chassis (3 screws) and the rear panel (1 screw) making sure the cable loom fits into notch in top of the phono can. See FIG11.

Part No.	Description	Qty
E041AY	Phono Can Assembly	1
HF4V09B	Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black	4

20. Assemble the display PCB to the fascia assembly

Part No.	Description	Qty
E919AY	Fascia Assembly (silver)	1
E919AYB	Fascia Assembly (black)	
HA3V06A	Screw Machine M3x6mm Pan Torx Steel Zinc-Plate Clear into standoffs	14

21. Assemble the fascia assembly and the display PCB to the chassis. Check the operation of mains button at this stage. Keep the foil bent upwards. Connect the flexfoil after the fascia assembly is fitted to the chassis.

Part No.	Description	Qty
HE6V06B	Self Tapping No6x6mm Pan Torx-Slot Steel Zinc-Plate Black	4

Connect L931CA from the digital board (SK901) to the display board (SK100).

22. Assemble the cover plate to the chassis

Part No.	Description	Qty
E826CP	Cover Plate (Silver)	1
E826CPB	Cover Plate (black)	
HA4V06S	Screw Machine M4x6mm Pan Torx St Steel Nickel	4
HA4V06B	Screw Machine M4x6mm Pan Torx St Steel Black	
HF4V09B	Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black	4

23. Fit the Phono Board Upgrade Kit, using L870AY board and the following parts. See FIG12 for assembly instructions.

Part No.	Description	Qty
H031	20 ff pillars	3
HF4V09B	Screw Self-Tapping-SEMS No4x9mm Pan Torx-Slot Steel Zinc-Plate Black into rear panel	1
HA3V06A	Screw Machine M3x6mm Pan Torx Steel Zinc-Plate Clear into pillars	6
L925CA	8-way AMP CT from phono (SK2) to audio (SK901) 280mm	1
	8-way connector	2

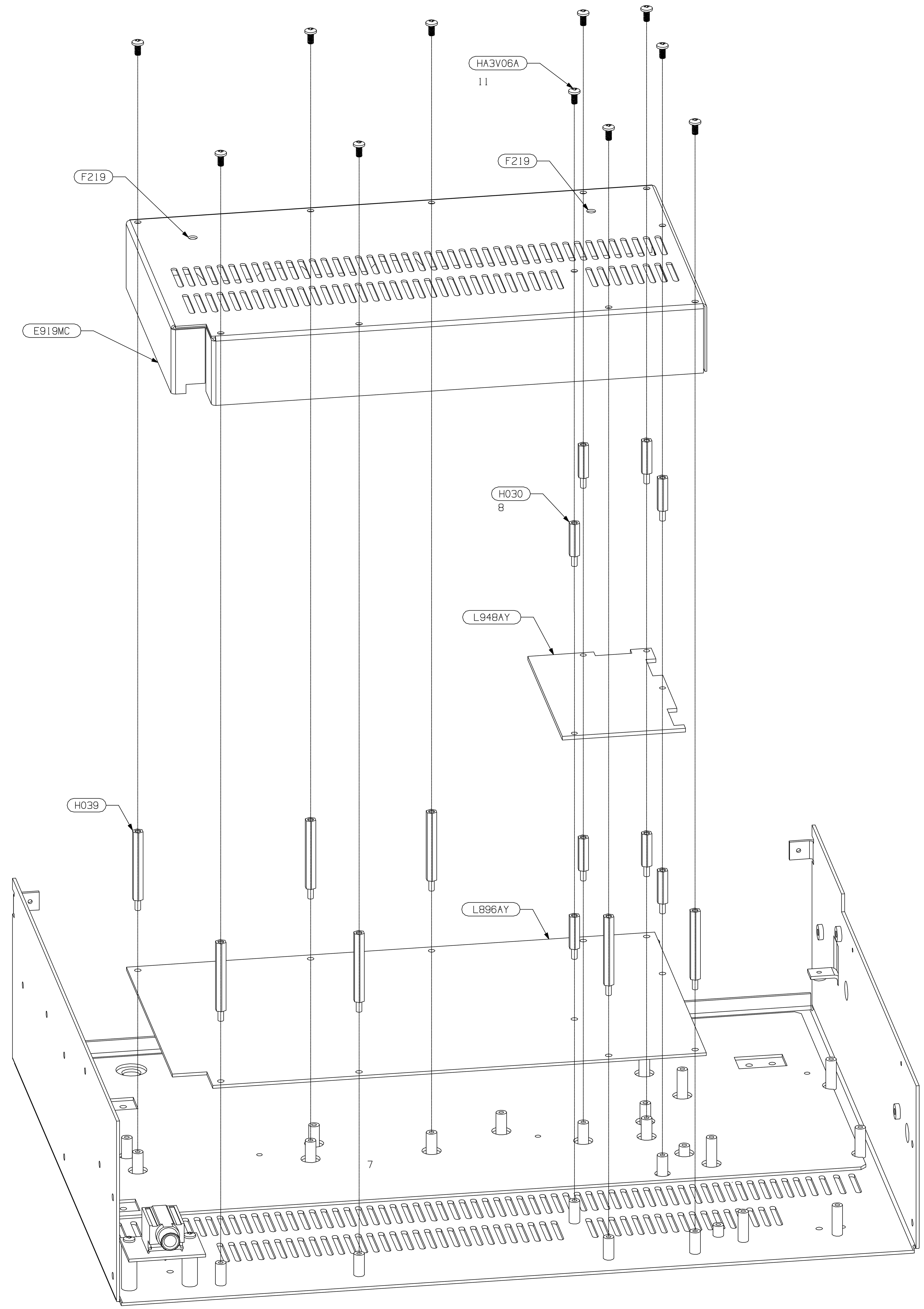


FIG9


FIG10

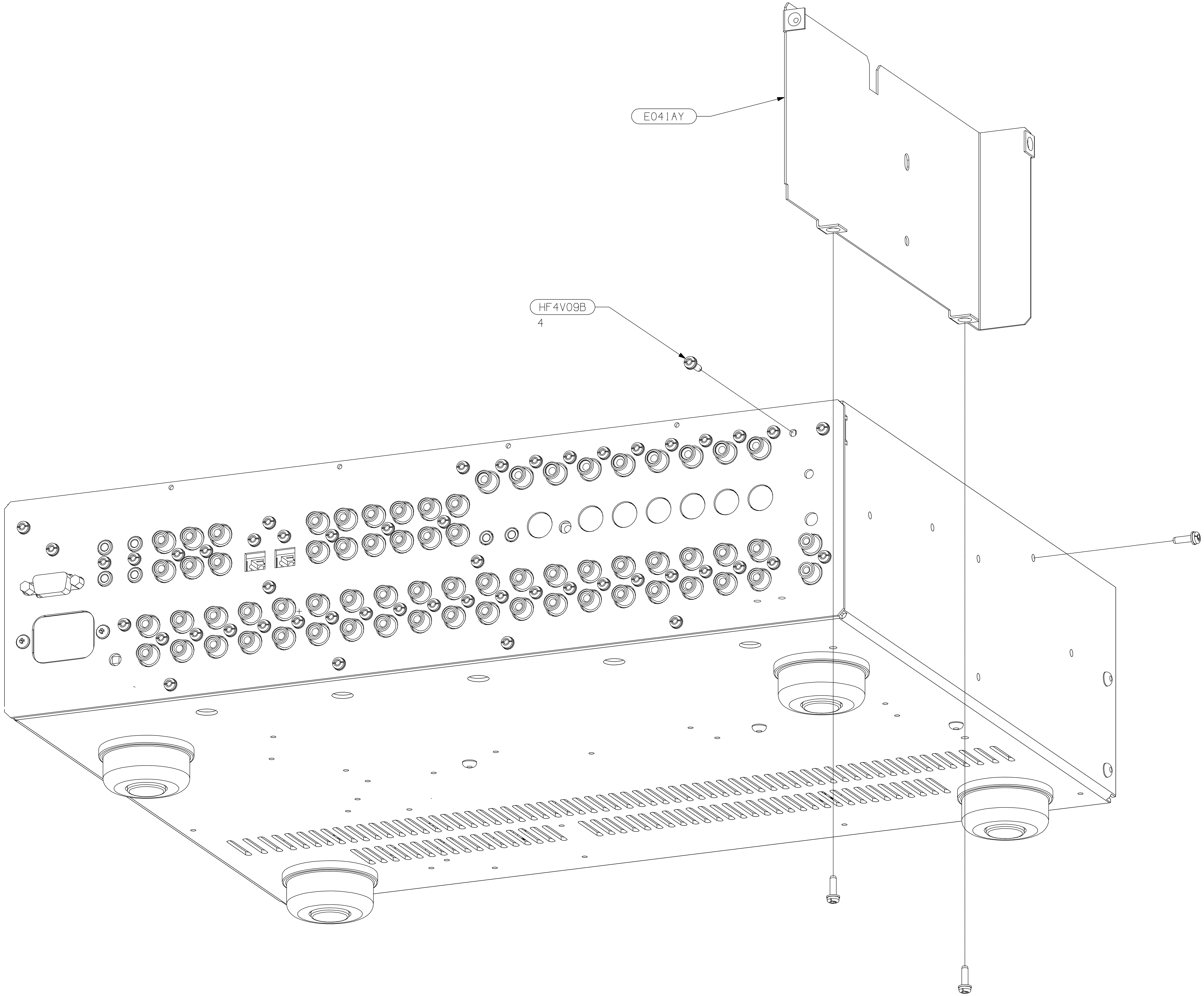


FIG11

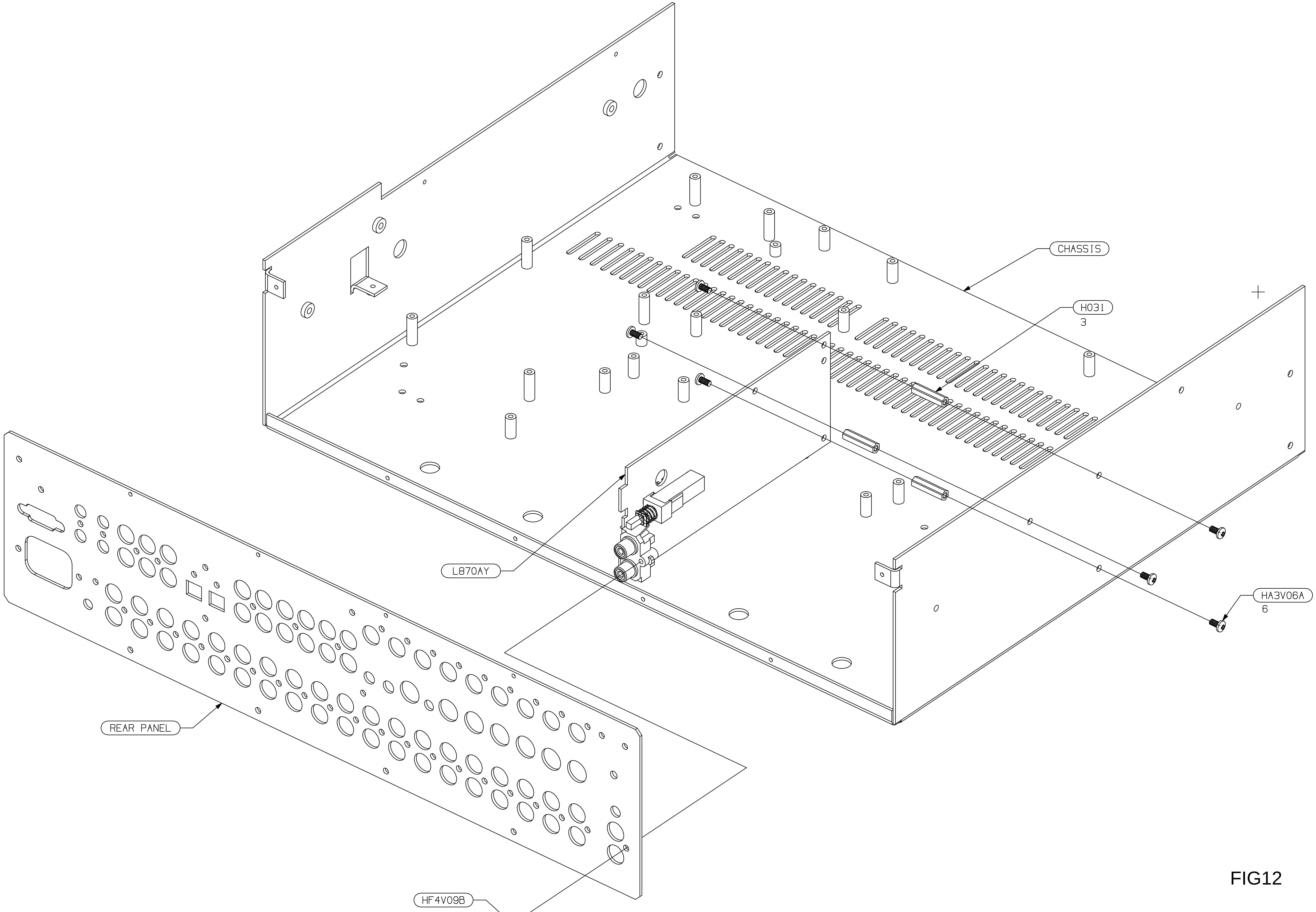


FIG12

Phono Board L870

Contents

- Circuit description
- Component overlay
- Parts list
- Circuit diagrams

AV8 Phono Board

Circuit Description
Refer to circuit diagram L870 sheet 1

The phono board is a simple single stage RIAA amplifier and consists of two channels of high gain amplification, and the ability to switch between moving magnet (MM) and moving coil (MC) settings.

PSU

The unit derives its ± 15V regulated rails from the unit it is fitted into with only local decoupling capacitors on board.

Interface

The unit connects to the host unit via a 8 way connector.

Amplification

The left channel has designators beginning with 100, and the right with 200. For the purposes of this description the left channel will be described, as the right channel is the same in all respects.

The amplifier is a small signal class A voltage feedback amplifier with switch able gain. The input consists of an actively loaded differential pair of very low noise PNP transistors (TR106, TR107). These transistors are very specific and should only be replaced with identical parts with the E grade high gain. TR100 and TR101 form a current source for the pair, which sets the quiescent current for the entire amplifier. The active load consists of TR110 and TR111, which forms part of the differential current mirror with TR112, TR113 & TR114. This differential stage also has an active load (TR102 & TR103) to keep gain to a maximum.

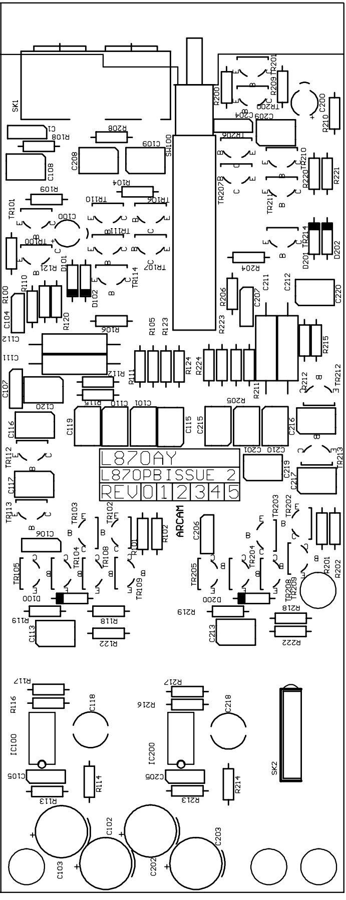
Both of these differential stages are designed to have as much gain as possible to enable the single stage design. The RIAA response is achieved in the feedback network: C101, C110, C111, C112, C119, C120 and R115, R112. C115 is used to correct between MM and MC gains as the amplifier is non-inverting.

SW100 switches between MM and MC. Two poles of the switch change between the different loading required for each type of the cartridge: R108 & C109 for MM and added in parallel for MC R104 & C108. The other two poles change the feedback resister value to alter the gain: R105 for MM and added in parallel for MC R123.

The DC offset is controlled by a non-inverting servo built around IC100. The amount of servo current is different for each gain setting via R111 (MM) and R124 (MC) so that the low frequency high pass point remains the same for both settings. However the high pass point for the circuit is set by C113. This gives a warp filter, stops DC start-up thumps from upsetting DC coupled circuitry and an approximation of the RIAA/IEC curve (-2dB @ 20Hz)

The output is class A buffered by a dual mirror follower (TR104, TR105, TR108, TR109). The quiescent current is set by D100 and R118 and R119.

Closed loop stability is achieved with C16, C117, giving symmetrical slewing capability.

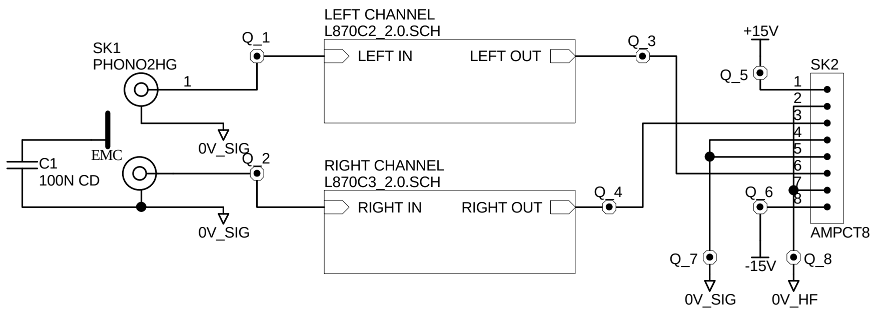

L870AY
L870PB ISSUE 2
REV 0 1 2 3 4 5
ARCAM

L870 Phono Board Parts List Issue 2.0

Designator	Part	Description
C1	2A410	CERD 100N 63V -20% +80% RA
C100	2N622	ELST 22U 63V
C101	2D210	PPRO 1N0 5% 63V RA
C102	2P710AS	ELEC 100U 25V SILMIC
C103	2P710AS	ELEC 100U 25V SILMIC
C104	2K410	PEST 100N 63V 10%
C105	2K410	PEST 100N 63V 10%
C106	2K410	PEST 100N 63V 10%
C107	2K410	PEST 100N 63V 10%
C108	2D147W	PPRO W 470P 63V 5% RA
C109	2D110W	PPRO W 100P 63V 5% RA
C110	2D247N	PPRO 4N7 63V 5% RA
C111	2D310	PPRO 10N 63V 1% AXIAL
C112	2D310	PPRO 10N 63V 1% AXIAL
C113	2K510	CAP MKS2 1U0 16V 10%
C115	2D213N	PPRO 1N3 63V 5% RA
C116	2D147W	PPRO W 470P 63V 5% RA
C117	2D147W	PPRO W 470P 63V 5% RA
C118	2U610	ELST NON POLAR 10UF 35V
C119	2D110N	PPRO 100P 63V 5% RA
C120	2D210	PPRO 1N0 5% 63V RA
C200	2N622	ELST 22U 63V
C201	2D210	PPRO 1N0 5% 63V RA
C202	2P710AS	ELEC 100U 25V SILMIC
C203	2P710AS	ELEC 100U 25V SILMIC
C204	2K410	PEST 100N 63V 10%
C205	2K410	PEST 100N 63V 10%
C206	2K410	PEST 100N 63V 10%
C207	2K410	PEST 100N 63V 10%
C208	2D147W	PPRO W 470P 63V 5% RA
C209	2D110W	PPRO W 100P 63V 5% RA
C210	2D247N	PPRO 4N7 63V 5% RA
C211	2D310	PPRO 10N 63V 1% AXIAL
C212	2D310	PPRO 10N 63V 1% AXIAL
C213	2K510	CAP MKS2 1U0 16V 10%
C215	2D213N	PPRO 1N3 63V 5% RA
C216	2D147W	PPRO W 470P 63V 5% RA
C217	2D147W	PPRO W 470P 63V 5% RA
C218	2U610	ELST NON POLAR 10UF 35V
C219	2D110N	PPRO 100P 63V 5% RA
C220	2D210	PPRO 1N0 5% 63V RA
D100	3A4148	SSDIODE 1N4148 75V
D101	3A4148	SSDIODE 1N4148 75V
D102	3A4148	SSDIODE 1N4148 75V
D200	3A4148	SSDIODE 1N4148 75V
D201	3A4148	SSDIODE 1N4148 75V
D202	3A4148	SSDIODE 1N4148 75V
IC100	5B071	IC FET OPAMP TL071
IC200	5B071	IC FET OPAMP TL071
PCB1	L870PB_2	PRINTED CIRCUIT BOARD
R100	1H133	RES MF W4 1% 330R
R101	1H110	RES MF W4 1% 100R
R102	1H110	RES MF W4 1% 100R
R104	1H110	RES MF W4 1% 100R
R105	1H110	RES MF W4 1% 100R
R106	1H110	RES MF W4 1% 100R
R108	1H347	RES MF W4 1% 47K
R109	1H312	RES MF W4 1% 12K
R110	1H312	RES MF W4 1% 12K
R111	1H356	RES MF W4 1% 56K
R112	1H410	RES MF W4 1% 100K
R113	1H410	RES MF W4 1% 100K
R114	1H410	RES MF W4 1% 100K
R115	1H315	RES MF W4 1% 15K
R116	1H522	RES MF W4 1% 2M2

L870 Phono Board Parts List Issue 2.0

Designator	Part	Description
R117	1H522	RES MF W4 1% 2M2
R118	1H022	RES MF W4 1% 22R
R119	1H022	RES MF W4 1% 22R
R120	1H022	RES MF W4 1% 22R
R121	1H022	RES MF W4 1% 22R
R122	1H339	RES MF W4 1% 39K
R123	1H010	RES MF W4 1% 10R
R124	1H256	RES MF W4 1% 5K6
R200	1H133	RES MF W4 1% 330R
R201	1H110	RES MF W4 1% 100R
R202	1H110	RES MF W4 1% 100R
R204	1H110	RES MF W4 1% 100R
R205	1H110	RES MF W4 1% 100R
R206	1H110	RES MF W4 1% 100R
R208	1H347	RES MF W4 1% 47K
R209	1H312	RES MF W4 1% 12K
R210	1H312	RES MF W4 1% 12K
R211	1H356	RES MF W4 1% 56K
R212	1H410	RES MF W4 1% 100K
R213	1H410	RES MF W4 1% 100K
R214	1H410	RES MF W4 1% 100K
R215	1H315	RES MF W4 1% 15K
R216	1H522	RES MF W4 1% 2M2
R217	1H522	RES MF W4 1% 2M2
R218	1H022	RES MF W4 1% 22R
R219	1H022	RES MF W4 1% 22R
R220	1H022	RES MF W4 1% 22R
R221	1H022	RES MF W4 1% 22R
R222	1H339	RES MF W4 1% 39K
R223	1H010	RES MF W4 1% 10R
R224	1H256	RES MF W4 1% 5K6
SK1	8D230	PHONO SKT 2-WAY HOR EMC GOLD
SK2	8K2408	8-WAY AMP CT CONN
SW100	A1013	SW PUSH 4PCO
TR100	4A556	TRANS LF SS P BC556B
TR101	4A556	TRANS LF SS P BC556B
TR102	4A556	TRANS LF SS P BC556B
TR103	4A556	TRANS LF SS P BC556B
TR104	4A556	TRANS LF SS P BC556B
TR105	4A556	TRANS LF SS P BC556B
TR106	4A1085	TRANS LF SS P 2SA1085
TR107	4A1085	TRANS LF SS P 2SA1085
TR108	4A546	TRANS LF SS N BC546B
TR109	4A546	TRANS LF SS N BC546B
TR110	4A546	TRANS LF SS N BC546B
TR111	4A546	TRANS LF SS N BC546B
TR112	4A546	TRANS LF SS N BC546B
TR113	4A546	TRANS LF SS N BC546B
TR114	4A546	TRANS LF SS N BC546B
TR200	4A556	TRANS LF SS P BC556B
TR201	4A556	TRANS LF SS P BC556B
TR202	4A556	TRANS LF SS P BC556B
TR203	4A556	TRANS LF SS P BC556B
TR204	4A556	TRANS LF SS P BC556B
TR205	4A556	TRANS LF SS P BC556B
TR206	4A1085	TRANS LF SS P 2SA1085
TR207	4A1085	TRANS LF SS P 2SA1085
TR208	4A546	TRANS LF SS N BC546B
TR209	4A546	TRANS LF SS N BC546B
TR210	4A546	TRANS LF SS N BC546B
TR211	4A546	TRANS LF SS N BC546B
TR212	4A546	TRANS LF SS N BC546B
TR213	4A546	TRANS LF SS N BC546B
TR214	4A546	TRANS LF SS N BC546B





DRAWING TITLE

A85 PHONO STAGE - TOP LEVEL

2 3 4 2 5

A & R Cambridge Ltd.
Pembroke Avenue
Denny Industrial Centre
Waterbeach
Cambridge CB5 9PB

Circuit Diagram

Notes:

ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
01_1070	JAG	17/4/01	updated pcb and scm	2
00_1051	JAG	22/3/01	PRODUCTION ISSUE	1

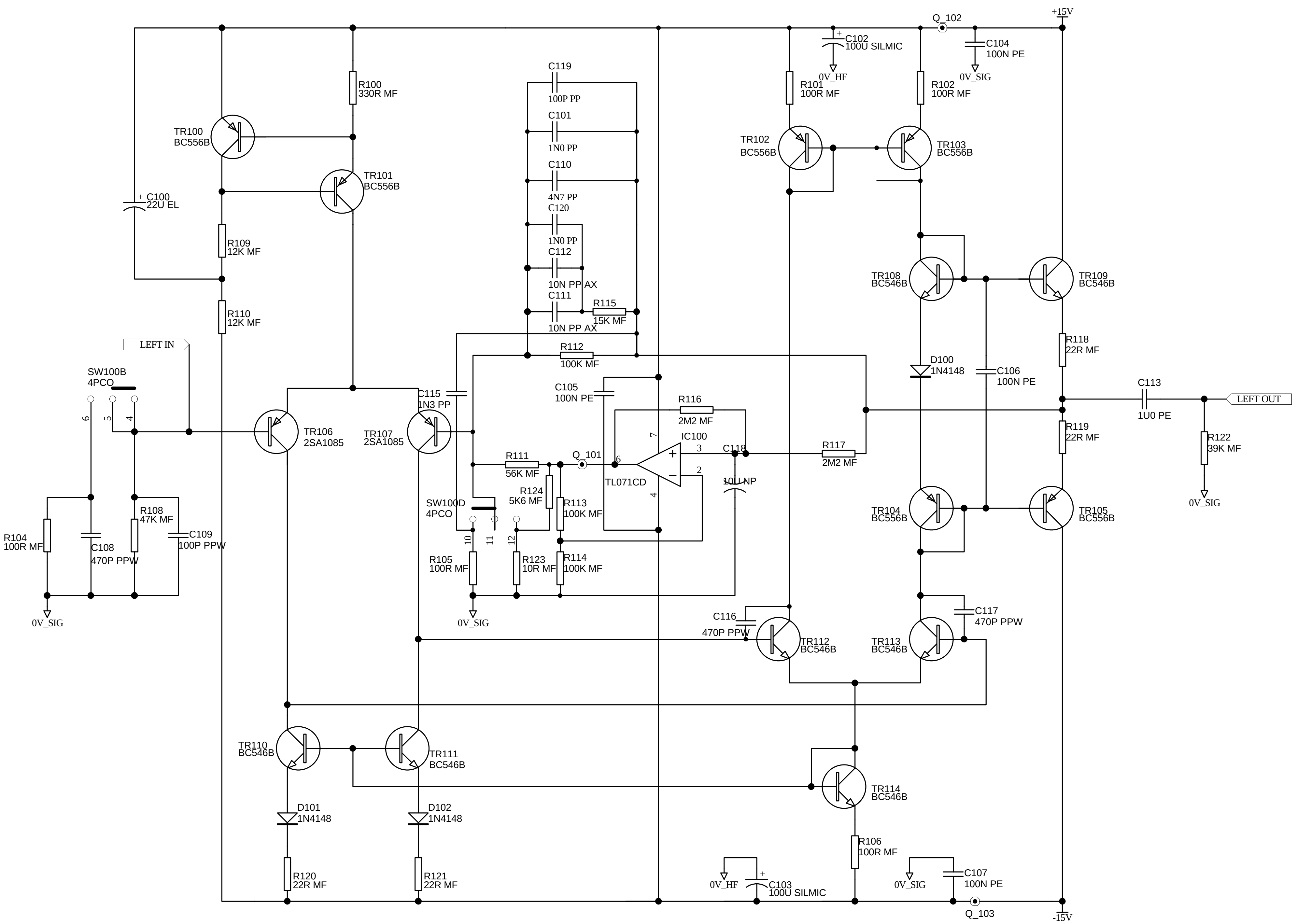
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Date Printed 23-Apr-2001

Drawn by: JBR

Sheet 1 of 3

DRAWING NO. L870C1



DRAWING TITLE

A85 PHONO STAGE - LEFT CHANNEL

Circuit Diagram

2 3 4 2 5

A & R Cambridge Ltd.
Pembroke Avenue
Denny Industrial Centre
Waterbeach
Cambridge CB5 9PB

Notes:

ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
01_1070	JAG	17/4/01	updated pcb and scm	2
00_1051	JAG	22/3/01	PRODUCTION ISSUE	1

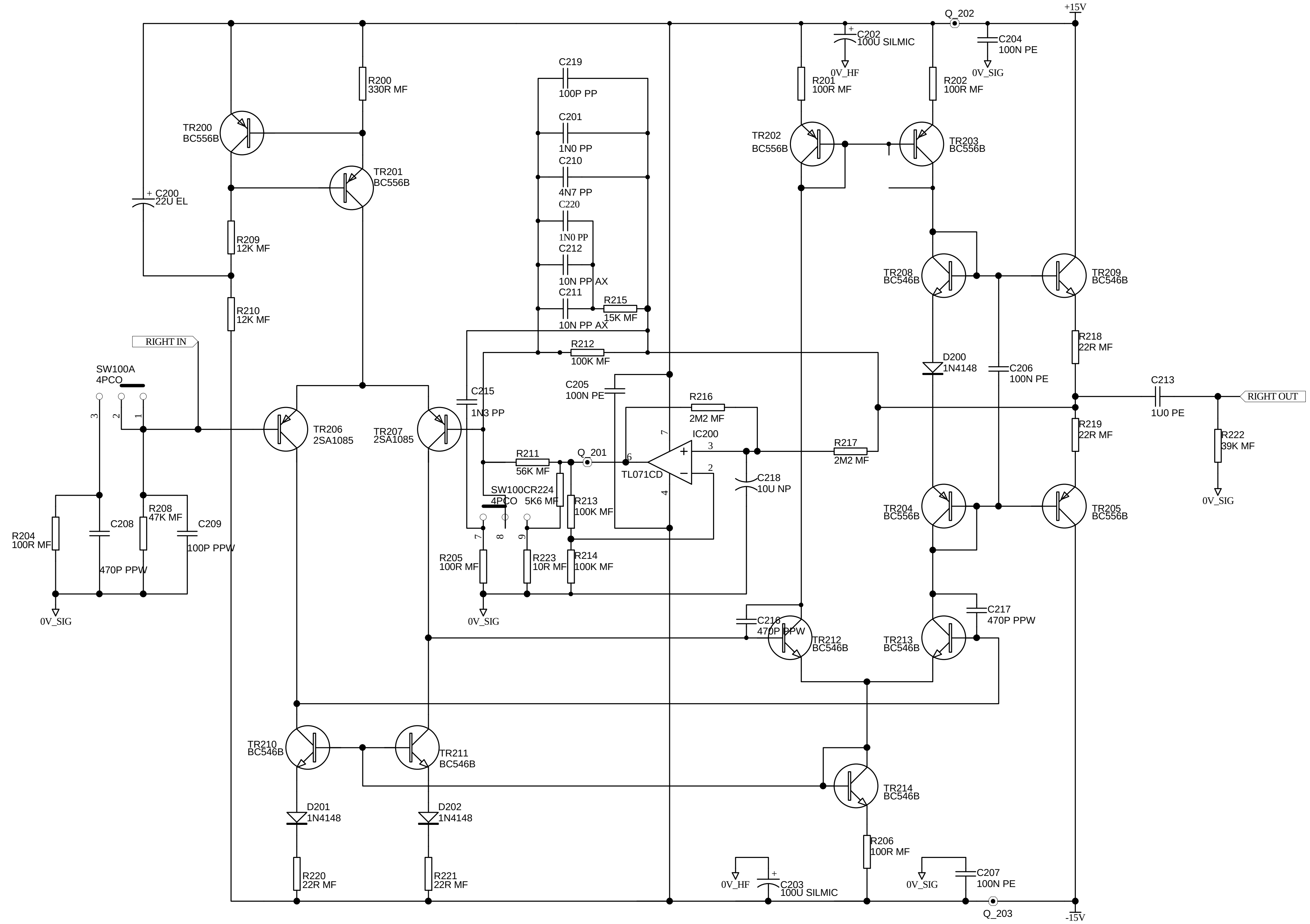
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Date Printed: 23-Apr-2001

Drawn by: JBR

Sheet 2 of 3

DRAWING NO. L870C2



DRAWING TITLE **A85 PHONO STAGE - RIGHT CHANNEL**					
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	00_1051	JAG	22/3/01	PRODUCTION ISSUE	1
	ECO No.	**INITIALS**	**DATE**	**DESCRIPTION OF CHANGE**	**ISSUE**

2 3 4 2 5

A & R Cambridge Ltd.
Pembroke Avenue
Denny Industrial Centre
Waterbeach
Cambridge CB5 9PB

Circuit Diagram

Notes:

Filename G:\DATA\ECO\ECO AGENDA\01_1070 I870 A85 PHONO ISSUE2\L870_2.0.ddb - L870C3_2.0.SCH

Date Printed 23-Apr-2001

Drawn by: JBR

Sheet 3 **of** 3

DRAWING NO. L870C3

Digital Board L896

Contents

- Circuit description
- Component overlay
- Parts list
- Circuit diagrams

AV8 Digital Board

Introduction
Refer to circuit diagram L896 sheet 1

The AV8 digital board is the heart of the AV8 surround sound decoder. It includes the H8S system control micro, the RS232 interface chip, the two Crystal DSPS one used for the surround sound decoding the other for THX post processing, a SPDIF receiver, four DACS, the bass redirection multiplexers and one ADC along with the associated support circuits and Power supply.

Connections

SK100 ADC input

Pin1	AGND
Pin2	Analogue right input
Pin3	AGND
Pin4	Analogue left input
Pin5	AGND

SK102 DAC output for left, right, centre and sub

Pin1	DACL
Pin2	DACGL
Pin3	DACR
Pin4	DACGR
Pin5	DACC
Pin6	DACGC
Pin7	DACS
Pin8	DACGS

SK103 DAC output for left / right surround and left / right surround back

Pin1	DACLS
Pin2	DACGLS
Pin3	DACRS
Pin4	DACGRS
Pin5	DACLSB
Pin6	DACGLSB
Pin7	DACRSB
Pin8	DACGRSB

SK900 connections to video board

Pin1	VIDSD - video serial data
Pin2	DGND - digital ground via 22R
Pin3	VIDSCLK - video serial clk
Pin4	DGND - digital ground via 22R
Pin5	VIDCL - video comp latch
Pin6	VIDSL - video svid latch
Pin7	SPDIFL - spdif latch
Pin8	VIDZCS - video zone2 cs
Pin9	VIDOC - video osd cs
Pin10	Z2 VID - zone2 video in present
Pin11	OSDVID - osd video in present
Pin12	PROG - Program
Pin13	VSYNC - vsync
Pin14	DGND - digital ground via 22R
Pin15	VSYNCZ2 - vsync zone2
Pin16	DGND - digital ground via 22R
Pin17	CSYNC - comp sync
Pin18	DGND - digital ground via 22R
Pin19	SPDIFRX - spdif rxn
Pin20	DGND - digital ground via 22R
Pin21	RX DATA - rxdata
Pin22	SIGGND - signal ground
Pin23	TXDATA - txdata
Pin24	DGND - digital ground via 22R
Pin25	DEM1 - demod1
Pin26	DGND - digital ground via 22R
Pin27	DEM2 - demod2
Pin28	DGND - digital ground via 22R
Pin29	SPDIFATX - spdif adc tx
Pin30	DGND - digital ground via 22R

SK901 connections to display board

Pin1	0VF2GND
Pin2	P5VF2
Pin3	P36VF1
Pin4	0VF1GND
Pin5	DISPBLK
Pin6	DGND
Pin7	DISPLAT
Pin8	DGND
Pin9	DISPCLK
Pin10	DGND
Pin11	DISPDAT
Pin12	P3V3D
Pin13	FCK2 - fclock2
Pin14	FCK1 - fclock1
Pin15	DGND
Pin16	IRFP - irfp in
Pin17	LEDEN - led enable
Pin18	PHB - phase B
Pin19	PHA - phase A
Pin20	KEYB2 - keyB2
Pin21	KEYB1 - keyB1
Pin22	KEYB0 - keyB0
Pin23	P5VD
Pin24	KEYBL - keyboard latch
Pin25	DGND
Pin26	LEDL - led latch
Pin27	DGND
Pin28	KEYBCK - keyboard clock
Pin29	DGND
Pin30	KEYBD - keyboard data

SK902 connections to audio board

Pin1	PHINS - phones inserted 3V3
Pin2	DGND - digital ground via 22R
Pin3	AUDSD - aud sdata
Pin4	DGND - digital ground via 22R
Pin5	AUDSCK - aud sclock
Pin6	DGND - digital ground via 22R
Pin7	AUDSEL0 - aud sel 0
Pin8	DGND - digital ground via 22R
Pin9	AUDSEL1 - aud sel 1
Pin10	DGND - digital ground via 22R
Pin11	AUDSEL2 - aud sel 2
Pin12	DGND - digital ground via 22R
Pin13	AUDCTRL - aud control enable
Pin14	DGND - digital ground via 22R
Pin15	DGND - digital ground via 22R
Pin16	DGND - digital ground via 22R
Pin17	DGND - digital ground via 22R
Pin18	DGND - digital ground via 22R
Pin19	DGND - digital ground via 22R
Pin20	DGND - digital ground via 22R
Pin21	DGND - digital ground via 22R
Pin22	DGND - digital ground via 22R

SK1000

Pin1	P18V
Pin2	AGND
Pin3	N18V
Pin4	P21V
Pin5	AGN
Pin6	N21V

SK1001

Pin1	P12V
Pin2	DGND
Pin3	N12V
Pin4	DGND
Pin5	P5V
Pin6	DGND
Pin7	P3V3
Pin8	DGND

SK1002

Pin1	PSU SYNC
Pin2	PSU GOOD
Pin3	PSU KILL
Pin4	DGND

SK1003

Pin1	P36VF1
Pin2	0VF1
Pin3	P36VSET
Pin4	P5VF2
Pin5	OVF2
Pin6	P5VF2SET
Pin7	N/C

ADC
Refer to circuit diagram L896 Sheet 2

The signals to the ADC are converted to balanced by the three opamps that also correct the level to the input of the ADC so that 2VRMS on the input of the first opamp provides a full-scale input to the ADC. 2.45V p-p (Note: not RMS)
A bias is added to the incoming signal so that it can be input to the ADC analogue section which operates on a single 5V rail. The bias is generated by the potential divider R216 and R217 this is 1.75V it is amplified by 1.43 by the opamp to give approximately 2.5V at the output of the opamps IC202 and IC203.

The diodes D200, D201, D202, D203 prevent over voltage signals from being presented to the input of the ADC, they do not protect the ADC if one of the opamp fails, as the diode will blow as well. The ADC itself is set to operate as a master for the I2S interface and to have its internal high pass filter enabled.

Data is output from the ADC on pin 15, it also generates a bit clock at 64xFS on pin 14 and a word clock at Fs on pin 13. The master clock on pin 17 is an input and should be at 256xFs.

DAC
Refer to circuit diagram L896 Sheets 3,4,5,6

The DAC sheets are all essentially the same and so are only described once below. The Sub DAC output has some minor differences that are described in the text.

The DAC is a 24bit 192KHz part it consists of a serial interface port, digital interpolation filter, multi bit sigma delta modulator and stereo DAC. The DAC is in hardware configuration mode (the control of emphasis and serial interface mode is set by pulling pins high and low on the DAC). The serial interface is set to I2S. The pins DM0 and DM1 control the de-emphasis filters and are controlled via a serial to parallel latch (IC905) connected to the micro.

DAC reset is used to initialise the part and is under the control of the microprocessor via a latch (IC905), it is an active low signal. DAC MUTE on the same latch is an active low signal and forces a soft mute of the output of the DAC.

The serial audio data interface consists of the DAC I2S LRCLK, DAC I2S BCLK and DAC I2S DATA.
DAC I2S LRCLK is the left right clock for the audio frames it should be a square wave at the sampling frequency. The signal is low during the left frame and high during the right frame.
DAC I2S BCLK is the bit clock for the data and data is clocked into the DAC on the rising edge of this clock. The bit clock operates at 64 times the left right clock.
DAC I2S DATA is the actual audio data it is should be presented in I2S format that is one bit offset MSB first data of up to 24bits. Each data frame consists of 32bits one offset bit 24 data bits and 7 empty zero bits. (If the actual data is less than 24 bits (i.e. from CD) the unused bits may also be empty zero.)

The output of the DAC is differential on the pins 16,17 for left and 12,13 for right. This signal passes into a second order multiple feedback type balanced to single ended filter. The filter is a second order Bessel function with a three dB point of approximately 75KHz. This filter has been reworked on the Bass output to have a three dB point of approximately 300Hz to reduce the HF noise introduced by the bass management section. The filter is unity gain however the balanced to single ended conversion introduces a gain of two. The output of the balanced to single ended converter should be 2Vrms for a full scale input. Following the filter is a buffer stage. The buffer stage performs two functions, it is a virtual earth mixer used to mix bass information into the other channels when a sub woofer is not present. Switching the CMOS switch 74HCT4053 controls the mix. The control of the CMOS switch is under microprocessor control via a latch (IC904). The second function of the buffer is to provide a ground sense to the Audio board. This allows the two boards to be loosely connected via a high impedance without introducing hum. The difference between the grounds on the two PCBS is sensed by the positive input of the opamp and added into the signal, this effectively removes any ground variation between the two PCBS. The full-scale output of the DAC should produce 2v RMS at the output of the buffer stage.

DAC performance specification

THD better than -95dB (0.0018%)
Noise level at output of buffer better than -100dB ref 2VRMS or 94dBV
Frequency response +/- 0.4dB 10Hz to 20KHz

The other components on the circuit are decoupling for the DAC, OPAMP and CMOS multiplexer. VMIDR and VMIDL are the output bias chains and should be at approximately half the Analogue Voltage rail (2.5V). AVDDL and AVDDR are the logic supply rails for the digital filter and the switched capacitor filter.

DSP
Refer to circuit diagram L896 Sheet 7

This is the Digital signal Processor sheet. IC701 is the main DSP it decodes the in coming data stream to provide the 5 channels of discrete audio from Dolby Digital, DTS or MPEG encoded material or a matrix decode of stereo information to 4 or five channel. The decoded data is passed to the second DSP IC702 that performs post processing on the signal, performing the THX equalisation Tone controls and Bass management.

The signal arrives at the first DSP either on the SPDIF I2S DATA line from the digital inputs or on ADC DATA 3.3V for analogue inputs. The SPDIF chip generates the clocks for its interfaces, and the master clocks as it is the system master. The ADC generates its own bit clock and word clock from the master clock it receives from the ADC. When the ADC is in use the master clock is generated by an 11.2896MHz crystal attached to the SPDIF receiver (IC803).

The audio data is passed between the two DSPS in a time domain multiplexed form on the DSP_AUD0 line. The clocks for this line are on DSP1_SCLK and DSP1_LRCLK. As six channels are passed between the two DSPS the interfaces works at 3x the normal I2S speed. (3x stereo channels equal to six channels).

Audio data passes out of the second DSP IC IC702 to the four DAC's via the serial terminators on pins 41 40 39 and 3. At this point the audio data is in I2S format. The DSP generates clocks for this audio data on pins 43 and 42 these are re-clocked and buffered by IC1102 and IC1100.

A system clock is passed to the DSP via pin30. This clock is multiplied inside the DSP chip using a phase locked loop. The phase locked loop filter (PLL) is made up of the components on pins 33 and 32. A smoothed supply is provided for the PLL via the ferrites L701 and L700.

Control of the DSPs from the micro-controller is via an SPI (serial peripheral interface) and uses pins 6,7,18,19,20. SPI is a Serial interface with clock (pin 7) and chip select (pin 18) in this implementation the read (pin 6) and write (pin19) lines are independent and pin 20 is the interrupt line.

Chips IC704 to IC708 are the SRAM and SRAM interface. IC704 is a level shifter from the 2.5V out of the DSP's to the 3.3V of the SRAM The components IC705 IC706 IC707 are the address latch. The address from the 8bit port on the DSP is latched through these three chips to form a 19 bit address for the SRAM chip. IC708 is the SRAM chip. The SRAM interface is used to provide the lip-sync function within the DSP.

SPDIF
Refer to circuit diagram L896 Sheet 8

The SPDIF receiver decodes the in coming SPDIF data into an I2S stream and extracts the clocks from the signal.

The SPDIF signal arrives at the input through the coupling cap C824. The SPDIF signal is BIPHASE decoded to extract the data and a PLL is synchronised to the left right preamble to generate the system clocks. In the absence of an input signal the chip switches over to the crystal oscillator on pin 21 this assumes that the input is now coming from the ADC. In this situation the only clock generated is the master clock, which is used by the ADC to generate the clocks for its I2S interface and by the DSPs to generate clocks at their outputs. If the system is in Stereo bypass mode (i.e. pure stereo operation) OMCLK STOP is used to shut down the crystal oscillator to reduce noise in the box.

The phase locked loop filter is made up of C820, C821 and R820. The supply for the PLL comes from P5VD via the local inductor to give a local smooth supply.

The SPDIF chip is controlled via an SPI interface on pins 1,28,27,2,19. Data is received on pin 27 CDIN, transmitted on pin 1 CDOUT, the clock is on pin 28 CCLK, Chip select is on Pin 2 and the interrupt line is on pin 19.

SPDIS EMPH indicates weather the incoming signal has emphasis or not. (Low = emphasis)

SPDIF RST This is the reset signal, at power up it is held low to keep the device in reset until the power is stable.

IC802 is the master clock buffer and fans out the master clock to the other chips inside the product. Each line is series terminated to reduce reflections on the line.

Microprocessor
Refer to circuit diagram L896 Sheet 9

This sheet contains the circuits for the H8S micro-controller. The micro-controller has control of all the system functions via its I/O ports.

UARTS

The RS232 port is connected to one (TXD1 RXD1) of the three UART interfaces the other two are used for the serial VFD display updates (TXD0, SCK0) and the control of the DSP chips (TXD2, RXD2, SCLK2).

RS232 input is buffered via IC902, which generates and receives the levels required for RS232 communication (+/- 12V)

INTERUPTS

Pins 33,34,37,38 are used as interrupts to the micro-controller. Pin 33 is the SPDIF interrupt, Pins 34 and 37 are the interrupts from the two DSP chips and 38 is the power fail interrupt.

RESET

The chip reset is formed using the Schmitt trigger inverters in IC907 and the RC delay formed of C936 and R921. This is used to latch the information on the program button through the d-type flip-flop IC908A. The reset is further delayed by the RC C903 R916 then used to release the reset on the Micro-controller. This is so that the micro-controller mode (Program or normal run) is set up before the reset is released on the micro.

DSP Clock

The clock for the DSP is generated from the Micro-controller clock and is output on PF7/0.
This output is at 24.576MHz. The 24.567MHz clock is divided by two by the D type Flip Flop IC908B. A 74LV74 is required to provide sufficient speed to generate a 12.288MHz signal to the DSPs. This output is under micro-controller control and is shut off when the DSPs are not being used. (I.e. stereo bypass mode and standby).

Static Port expanders

IC904 and 905 provide static control lines for the noise sensitive parts of the circuit, the DACs and ADC. They are serial programmed via a bit bashed SPI type interface. Q900 generates a output enable low signal from the reset signal.

Buffers

IC900 is a level shifting buffer between 5V signals and the 3.3V tolerant inputs on the micro.

EEPROM

A 8k EEPROM is used to store the configuration information this is IC906 it is addressed using a bit bashed I2C interface.

Connectors

The three main control connectors are also on this sheet and connect to the video SK900 audio SK902 and front panel SK 901 PCBs.

Power Supply
Refer to circuit diagram L896 Sheet 10

The power supply sheet contains the connectors from the power supply.
SK1003 display supply.
SK1000 Analogue supply.
SK1001 Digital Supplies.
SK1002 Power supply control.

Each of the supplies that is used passes through a LC filter to reduce any noise in both directions i.e. noise coming in from the switched mode supply or noise getting out from the noise on the digital board.

PSU Sync signal

The sync signal is derived from the I2S bit clock (64xFS) signal, which is divided down by IC1001 and the appropriate output to sent (either 96KHz or 88.1 KHz) to the PSU by the multiplexer IC1002.

Voltage set and VFD HT shut down

Two resistors set the voltage the Switch mode supply generates for the display R1008 sets the HT voltage to 36V and R1007 set the Heater voltage to 5V.

To prevent anode stripping when the heater is switched off the VFD display has a HT shut down this is performed by Q1000 which shorts the voltage set resistor R1008 to ground.

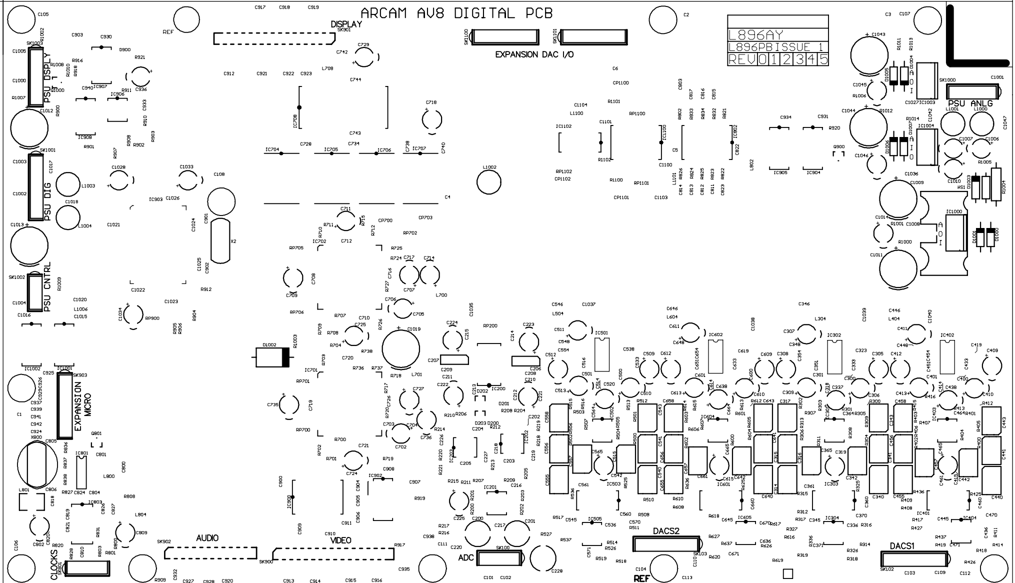
Regulators

Three regulators are used to provide secondary regulation for the +/- 15V signal (it is already regulated to +/- 18V on the PSU PCB) and the 5V analogue supply that is derived from the 18V regulated supply.

The 2.5V supply for the DSP chips is derived from the 3.3V supply by using the forward voltage drop of a diode. And a negative 5V rail is generated using a zenner to provide the bias voltage for the CMOS switches used in the bass management.

Re-clocking
Refer to circuit diagram L896 Sheet 11

The re-clocking of all of the I2S signals to the DACs is performed by IC1102 which clocks them all through the d-type flip flops synchronous to the master clock on pin 9. The Data signals then go straight to the DACs via series termination resistors. The Bit clock and word clocks are buffered by IC1100 to provide fan out to the four DACs each with their own series terminator to reduce reflections.



ARCAM AV8 DIGITAL PCB
L896AY
L896PBISSUE 1
REV 0 1 2 3 4 5
DISPLAY
EXPANSION DAC I/O
PSU DSPLY
PSU DIG
PSU CNTRL
PSU ANLG
EXPANSION MICRO
CLOCKS
AUDIO
VIDEO
ADC
DACS2
DACS1
REF

L896 Digital Board Parts List Issue 1.6

Designator	Part	Description
C1	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C2	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C3	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C4	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C5	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C6	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C101	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C102	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C103	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C104	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C105	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C106	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C107	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C108	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C109	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C110	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C111	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C112	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C113	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C200	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C201	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C202	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C203	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C204	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C205	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C206	2K322	Capacitor Boxed Polyester 5mm Pitch 5% 63V 22N
C207	2K322	Capacitor Boxed Polyester 5mm Pitch 5% 63V 22N
C208	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C209	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C210	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C211	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C212	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C213	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C214	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C215	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C216	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C217	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C218	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C219	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C220	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C221	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C222	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C223	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C224	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C225	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C226	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C227	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C228	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C300	2L133	Capacitor SM 0805 NPO Ceramic 5% 100V 330P
C301	2L133	Capacitor SM 0805 NPO Ceramic 5% 100V 330P
C305	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C306	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C307	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C308	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C309	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C314	2K447	Capacitor Boxed Polyester 5mm Pitch 10% 63V 470N
C315	2K447	Capacitor Boxed Polyester 5mm Pitch 10% 63V 470N
C316	2K347	Capacitor Boxed Polyester 5mm Pitch 10% 63V 47N
C317	2K347	Capacitor Boxed Polyester 5mm Pitch 10% 63V 47N
C318	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C319	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C323	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N

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Designator	Part	Description
C333	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C336	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C337	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C340	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C341	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C342	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C343	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C345	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C346	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C348	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C351	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C354	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C360	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C361	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C364	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C365	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C370	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C371	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C400	2L133	Capacitor SM 0805 NPO Ceramic 5% 100V 330P
C401	2L133	Capacitor SM 0805 NPO Ceramic 5% 100V 330P
C409	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C410	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C411	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C412	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C413	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C414	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C415	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C419	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C433	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C436	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C438	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C440	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C441	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C442	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C443	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C445	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C446	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C448	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C451	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C454	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C455	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C456	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C457	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C458	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C460	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C461	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C464	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C465	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C470	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C471	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C500	2L133	Capacitor SM 0805 NPO Ceramic 5% 100V 330P
C501	2L133	Capacitor SM 0805 NPO Ceramic 5% 100V 330P
C509	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C510	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C511	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C512	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C513	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C514	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C515	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C516	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C520	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C533	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N

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Designator	Part	Description
C536	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C538	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C540	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C541	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C542	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C543	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C545	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C546	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C548	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C554	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C555	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C556	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C557	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C558	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C560	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C561	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C564	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C565	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C570	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C571	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C600	2L133	Capacitor SM 0805 NPO Ceramic 5% 100V 330P
C601	2L133	Capacitor SM 0805 NPO Ceramic 5% 100V 330P
C609	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C610	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C611	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C612	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C613	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C614	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C615	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C619	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C633	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C636	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C638	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C640	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C641	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C642	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C643	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C645	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C646	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C648	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C651	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C654	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C655	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C656	2D222	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 2N2
C657	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C658	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C660	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C661	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C664	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C665	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C670	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C671	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C702	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C703	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C704	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C705	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C706	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C707	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C708	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C709	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C710	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C711	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V

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Designator	Part	Description
C712	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C714	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C716	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C717	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C718	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C719	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C720	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C721	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C724	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C725	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C726	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C727	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C728	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C729	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C734	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C735	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C736	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C738	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C740	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C742	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C743	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C744	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C800	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C801	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C802	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C803	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C804	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C805	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C806	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C809	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C810	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C811	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C812	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C813	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C814	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C815	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C816	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C817	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C818	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C819	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C820	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C821	2JA247	Capacitor SM 0805 X7R Ceramic 10% 100V 4N7
C822	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C823	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C824	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C826	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C827	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C900	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C901	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C902	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C903	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C904	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C905	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C906	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C907	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C908	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C909	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C910	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C911	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C912	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C913	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C914	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V

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Designator	Part	Description
C915	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C916	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C917	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C918	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C919	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C920	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C921	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C922	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C923	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C924	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C925	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C926	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C927	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C928	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C929	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C930	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C931	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C932	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C933	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C934	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C935	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C936	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C937	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C938	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C939	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C940	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C941	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C942	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C1000	2W210X4	Capacitor Network SM 0612 NP0 Ceramic 1000P X 4 50V
C1001	2W210X4	Capacitor Network SM 0612 NP0 Ceramic 1000P X 4 50V
C1002	2W210X4	Capacitor Network SM 0612 NP0 Ceramic 1000P X 4 50V
C1003	2W210X4	Capacitor Network SM 0612 NP0 Ceramic 1000P X 4 50V
C1004	2W210X4	Capacitor Network SM 0612 NP0 Ceramic 1000P X 4 50V
C1005	2W210X4	Capacitor Network SM 0612 NP0 Ceramic 1000P X 4 50V
C1006	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1007	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1008	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1009	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C1010	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C1011	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C1012	2N810A	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 1000UF 10V
C1013	2N810A	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 1000UF 10V
C1014	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1015	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1016	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1017	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1018	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1019	2N810A	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 1000UF 10V
C1020	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1021	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1022	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1023	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1024	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1025	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1026	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1027	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1028	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C1033	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C1034	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C1035	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1036	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1037	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N

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Designator	Part	Description
C1038	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1039	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1040	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1042	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1043	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C1044	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C1045	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1046	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1047	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1100	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1101	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1103	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1104	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
CP700	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
CP703	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
CP1100	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
CP1101	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
CP1102	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
D200	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D201	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D202	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D203	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D900	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D1000	3B4003	Diode 1N4003 DO-41 Package
D1001	3B4003	Diode 1N4003 DO-41 Package
D1002	3B5403	Diode 1N5403 DO-201AD Package
D1003	3C05104	Zener Diode 0.5W BZX79C5V1 DO-35 Package
D1004	3B4003	Diode 1N4003 DO-41 Package
D1005	3B4003	Diode 1N4003 DO-41 Package
D1006	3B4003	Diode 1N4003 DO-41 Package
D1007	3B4003	Diode 1N4003 DO-41 Package
HS1	F004	HEATSINK BLACK TO220 23.7 degC/W
IC200	5A5383	IC DUAL 24BIT ADC 96KHZ SM
IC201	5B2134	Opamp OPA2134UA SO-8 Package
IC202	5B2134	Opamp OPA2134UA SO-8 Package
IC203	5B2134	Opamp OPA2134UA SO-8 Package
IC301	5B2134	Opamp OPA2134UA SO-8 Package
IC302	5A8740	IC AUDIO DAC XWM8740EDS SSOP-28 PACKAGE
IC303	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC304	5B2134	Opamp OPA2134UA SO-8 Package
IC401	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC402	5A8740	IC AUDIO DAC XWM8740EDS SSOP-28 PACKAGE
IC403	5B2134	Opamp OPA2134UA SO-8 Package
IC404	5B2134	Opamp OPA2134UA SO-8 Package
IC501	5A8740	IC AUDIO DAC XWM8740EDS SSOP-28 PACKAGE
IC502	5B2134	Opamp OPA2134UA SO-8 Package
IC503	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC505	5B2134	Opamp OPA2134UA SO-8 Package
IC601	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC602	5A8740	IC AUDIO DAC XWM8740EDS SSOP-28 PACKAGE
IC604	5B2134	Opamp OPA2134UA SO-8 Package
IC605	5B2134	Opamp OPA2134UA SO-8 Package
IC701	5H49326	IC AUDIO DSP CS49326 PLCC-44 PACKAGE
IC702	5H49330	IC AUDIO DSP CS49330 PLCC-44 PACKAGE
IC704	5KLVC245	IC OCTAL 3 STATE TRANSCIEVER 5V TOL 74LVC245AD SMT
IC705	5KLVC574	IC OCTAL D TYPE 5V TOL74LVC574AD SMT
IC706	5KLVC574	IC OCTAL D TYPE 5V TOL74LVC574AD SMT
IC707	5KLVC574	IC OCTAL D TYPE 5V TOL74LVC574AD SMT
IC708	5H1049	IC Static RAM 512Kx8 15ns CY7C1049BV33 SOJ-36 Package
IC801	5K7404LVCU	IC HEX INVERTER UNBUFFERED 5V TOL 74LVCU04D SMT
IC802	5KLVC244	IC OCTAL 3 STATE BUFFER 5V TOL 74LVC244AD SMT
IC803	5A8415R	IC DIGITAL AUDIO RECEIVER CS8415A-CR TSSOP-28 PACKAGE

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Designator	Part	Description
IC900	5KLVC244	IC OCTAL 3 STATE BUFFER 5V TOL 74LVC244AD SMT
IC902	5N202E	IC RS232 Charge Pump Driver MAX202ECSE Static protected
IC903	5H64F2329	IC Microprocessor H8 HD64F2329VF25 QFP-128 Package
IC904	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC905	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC906	5G24LC16	IC SERIAL EEPROM 24LC16BT/SN 8K SO-8 PACKAGE
IC907	5KLVC14	IC HEX INVERTING SCHMITT TRIGGER WITH 5V TOLERANT INPUT
IC908	5K74LV74	LOW VOLTAGE HCMOS 74LV74D DUAL FF SM
IC1000	5D317T	IC VOLTAGE REGULATOR ADJ LM317T TO-220 PACKAGE
IC1001	5K4040	IC 12-STAGE BINARY RIPPLE COUNTER74HCT4040D SMT
IC1002	5K4051	IC 8 CHANNEL ANALOG MUX 74HC4051D SMT
IC1003	5D317T	IC VOLTAGE REGULATOR ADJ LM317T TO-220 PACKAGE
IC1004	5D337	IC VOLTAGE REGULATOR NEG ADJ LM337T TO-220 PACKAGE
IC1100	5KLVC244	IC OCTAL 3 STATE BUFFER 5V TOL 74LVC244AD SMT
IC1102	5KLV174	5KLV174 74LV174 D SM HEX DTYPE FF
L304	7F004	Ferrite Bead SM1206 70R@100MHz
L404	7F004	Ferrite Bead SM1206 70R@100MHz
L504	7F004	Ferrite Bead SM1206 70R@100MHz
L604	7F004	Ferrite Bead SM1206 70R@100MHz
L700	7F004	Ferrite Bead SM1206 70R@100MHz
L701	7F004	Ferrite Bead SM1206 70R@100MHz
L708	7F004	Ferrite Bead SM1206 70R@100MHz
L800	7F004	Ferrite Bead SM1206 70R@100MHz
L801	7B033	Inductor Surface Mount 33U
L802	7F004	Ferrite Bead SM1206 70R@100MHz
L804	7F004	Ferrite Bead SM1206 70R@100MHz
L1000	7D968A	Inductor 6U8
L1001	7D968A	Inductor 6U8
L1002	7D968A	Inductor 6U8
L1003	7D968A	Inductor 6U8
L1004	7D968A	Inductor 6U8
L1006	7F004	Ferrite Bead SM1206 70R@100MHz
L1100	7F004	Ferrite Bead SM1206 70R@100MHz
L1101	7F004	Ferrite Bead SM1206 70R@100MHz
PB	L896PB	BLANK PCB AV8 DIGITAL PCB
Q801	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q900	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q1000	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
R200	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R201	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R202	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R203	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R204	1M251	Resistor 0805 Surface Mount 0.125W 1% 5K1
R205	1M251	Resistor 0805 Surface Mount 0.125W 1% 5K1
R206	1M251	Resistor 0805 Surface Mount 0.125W 1% 5K1
R207	1M251	Resistor 0805 Surface Mount 0.125W 1% 5K1
R208	1M222	Resistor 0805 Surface Mount 0.125W 1% 2K2
R209	1M222	Resistor 0805 Surface Mount 0.125W 1% 2K2
R210	1M222	Resistor 0805 Surface Mount 0.125W 1% 2K2
R211	1M222	Resistor 0805 Surface Mount 0.125W 1% 2K2
R212	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R213	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R214	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R215	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R216	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R217	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R218	1M251	Resistor 0805 Surface Mount 0.125W 1% 5K1
R219	1M251	Resistor 0805 Surface Mount 0.125W 1% 5K1
R220	1M251	Resistor 0805 Surface Mount 0.125W 1% 5K1
R221	1M251	Resistor 0805 Surface Mount 0.125W 1% 5K1
R300	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R301	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3

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Designator	Part	Description
R302	1M222	Resistor 0805 Surface Mount 0.125W 1% 2K2
R303	1M222	Resistor 0805 Surface Mount 0.125W 1% 2K2
R304	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R305	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R306	1M182	Resistor 0805 Surface Mount 0.125W 1% 820R
R307	1M268	Resistor 0805 Surface Mount 0.125W 1% 6K8
R308	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R309	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R311	1M268	Resistor 0805 Surface Mount 0.125W 1% 6K8
R312	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R313	1M182	Resistor 0805 Surface Mount 0.125W 1% 820R
R314	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R315	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R316	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R317	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R318	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R319	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R325	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R326	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R327	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R336	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R400	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R401	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R402	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R403	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R404	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R405	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R406	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R407	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R408	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R409	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R411	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R412	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R413	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R414	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R415	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R416	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R417	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R418	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R419	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R425	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R426	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R427	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R436	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R437	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R500	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R501	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R502	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R503	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R504	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R505	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R506	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R507	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R508	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R510	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R511	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R512	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R513	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R514	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R515	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R516	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R517	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R

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Designator	Part	Description
R518	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R519	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R525	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R526	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R527	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R536	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R537	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R600	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R601	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R602	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R603	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R604	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R605	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R606	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R607	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R608	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R610	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R612	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R613	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R614	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R615	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R616	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R617	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R618	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R619	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R620	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R625	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R626	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R627	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R636	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R637	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R700	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R701	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R702	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R704	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R707	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R708	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R709	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R710	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R711	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R712	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R715	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R717	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R718	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R719	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R720	1M418	Resistor 0805 Surface Mount 0.125W 1% 180K
R724	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R725	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R726	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R727	1M418	Resistor 0805 Surface Mount 0.125W 1% 180K
R736	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R737	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R738	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R800	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R801	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R802	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R803	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R808	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R820	1M212	Resistor 0805 Surface Mount 0.125W 1% 1K2
R821	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R822	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R823	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R

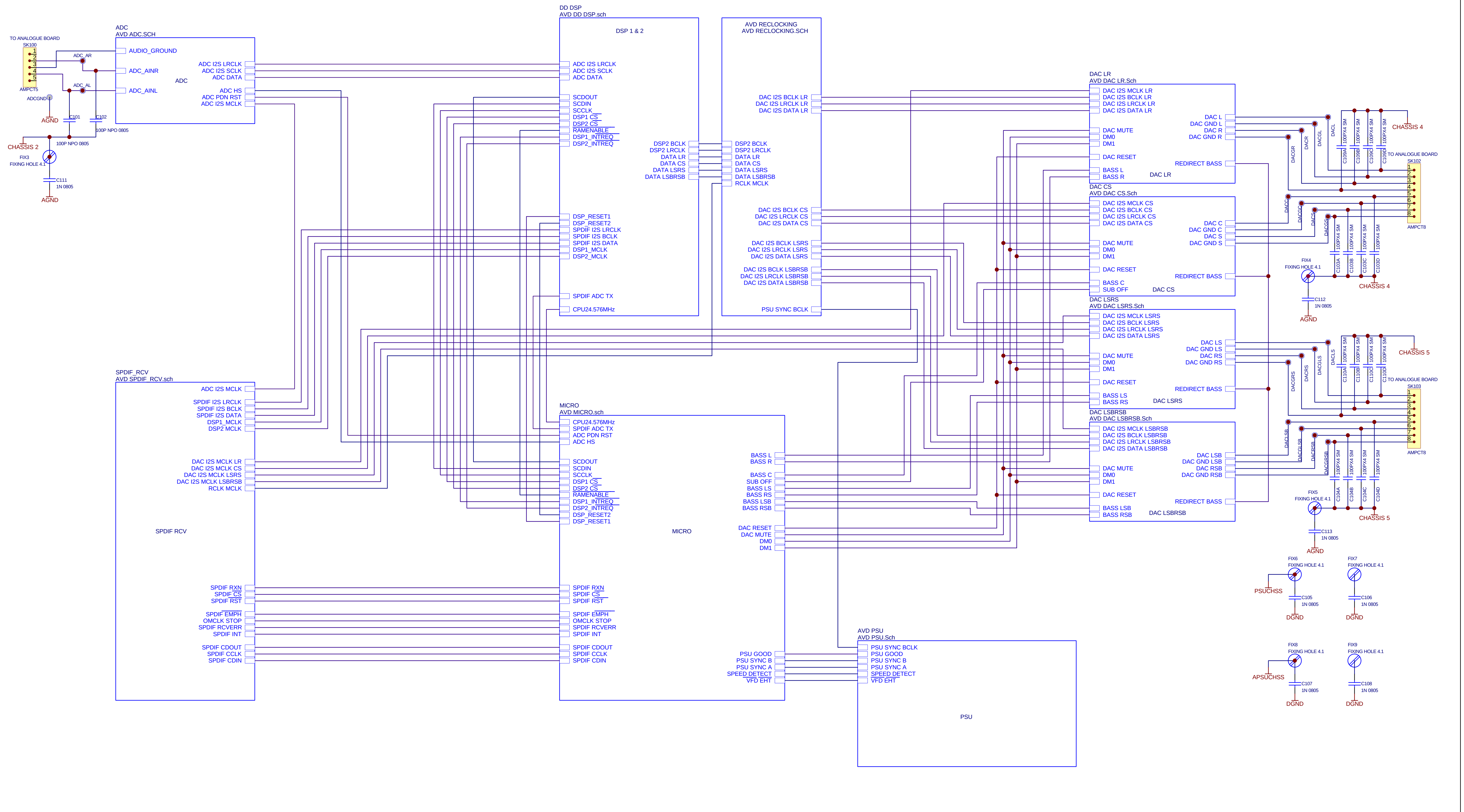
L896 Digital Board Parts List Issue 1.6

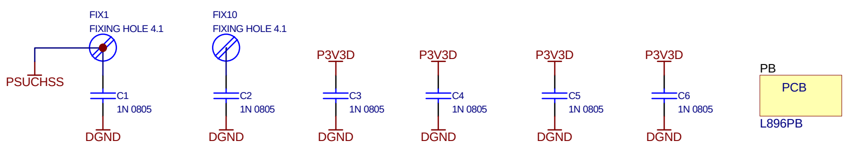
Designator	Part	Description
R824	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R825	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R826	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R827	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R828	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R831	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R832	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R833	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R834	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R836	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R837	1M547	Resistor 0805 Surface Mount 0.125W 1% 4M7
R838	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R900	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R901	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R902	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R903	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R904	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R905	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R906	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R907	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R908	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R909	1M022	Resistor 0805 Surface Mount 0.125W 1% 22R
R910	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R911	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R912	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R916	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R917	1M022	Resistor 0805 Surface Mount 0.125W 1% 22R
R918	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R919	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R920	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R921	1M333	Resistor 0805 Surface Mount 0.125W 1% 33K
R1000	1M212	Resistor 0805 Surface Mount 0.125W 1% 1K2
R1001	1M139	Resistor 0805 Surface Mount 0.125W 1% 390R
R1002	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R1003	1M139	Resistor 0805 Surface Mount 0.125W 1% 390R
R1004	1D110	Resistor Carbon Film 0W5 5% 100R
R1005	1H233	Resistor Metal Film 0.25W 1% 3K3
R1006	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R1007	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R1008	1M333	Resistor 0805 Surface Mount 0.125W 1% 33K
R1009	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R1010	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R1011	1M224	Resistor 0805 Surface Mount 0.125W 1% 2K4
R1012	1M224	Resistor 0805 Surface Mount 0.125W 1% 2K4
R1013	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R1014	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R1100	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R1101	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R1102	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
RP200	1V110B	Resistor Pack Surface Mount 4 Isolated Resistors 100R
RP700	1V310B	Resistor Pack Surface Mount 4 Isolated Resistors 10K
RP701	1V310B	Resistor Pack Surface Mount 4 Isolated Resistors 10K
RP702	1V110B	Resistor Pack Surface Mount 4 Isolated Resistors 100R
RP705	1V310B	Resistor Pack Surface Mount 4 Isolated Resistors 10K
RP706	1V310B	Resistor Pack Surface Mount 4 Isolated Resistors 10K
RP900	1V110B	Resistor Pack Surface Mount 4 Isolated Resistors 100R
RP1100	1V110B	Resistor Pack Surface Mount 4 Isolated Resistors 100R
RP1101	1V110B	Resistor Pack Surface Mount 4 Isolated Resistors 100R
RP1102	1V110B	Resistor Pack Surface Mount 4 Isolated Resistors 100R
SK100	8K2005	CON CT SERIES VERTICAL 5WAY
SK102	8K2408	CON CT SERIES VERTICAL 8WAY
SK103	8K2408	CON CT SERIES VERTICAL 8WAY

L896 Digital Board Parts List Issue 1.6

Designator	Part	Description
SK801	8K2005	CON CT SERIES VERTICAL 5WAY
SK900	8K8330	CON 1.00MM VERTICAL SM FFC 30WAY
SK901	8K8330	CON 1.00MM VERTICAL SM FFC 30WAY
SK902	8K8322	CON 1.00MM VERTICAL SM FFC 22WAY
SK903	8K2408	CON CT SERIES VERTICAL 8WAY
SK1000	8K2406	CON CT SERIES VERTICAL 6WAY
SK1001	8K2408	CON CT SERIES VERTICAL 8WAY
SK1002	8K2404	CON CT SERIES VERTICAL 4WAY
SK1003	8K2407	CON CT SERIES VERTICAL 7WAY
SK1100	8K2408	CON CT SERIES VERTICAL 8WAY
SK1101	8K2408	CON CT SERIES VERTICAL 8WAY
X2	7X036	Crystal 24.576MHz HC49
X800	7X011	Crystal 11.2896MHz

AV8 DIGITAL BOARD

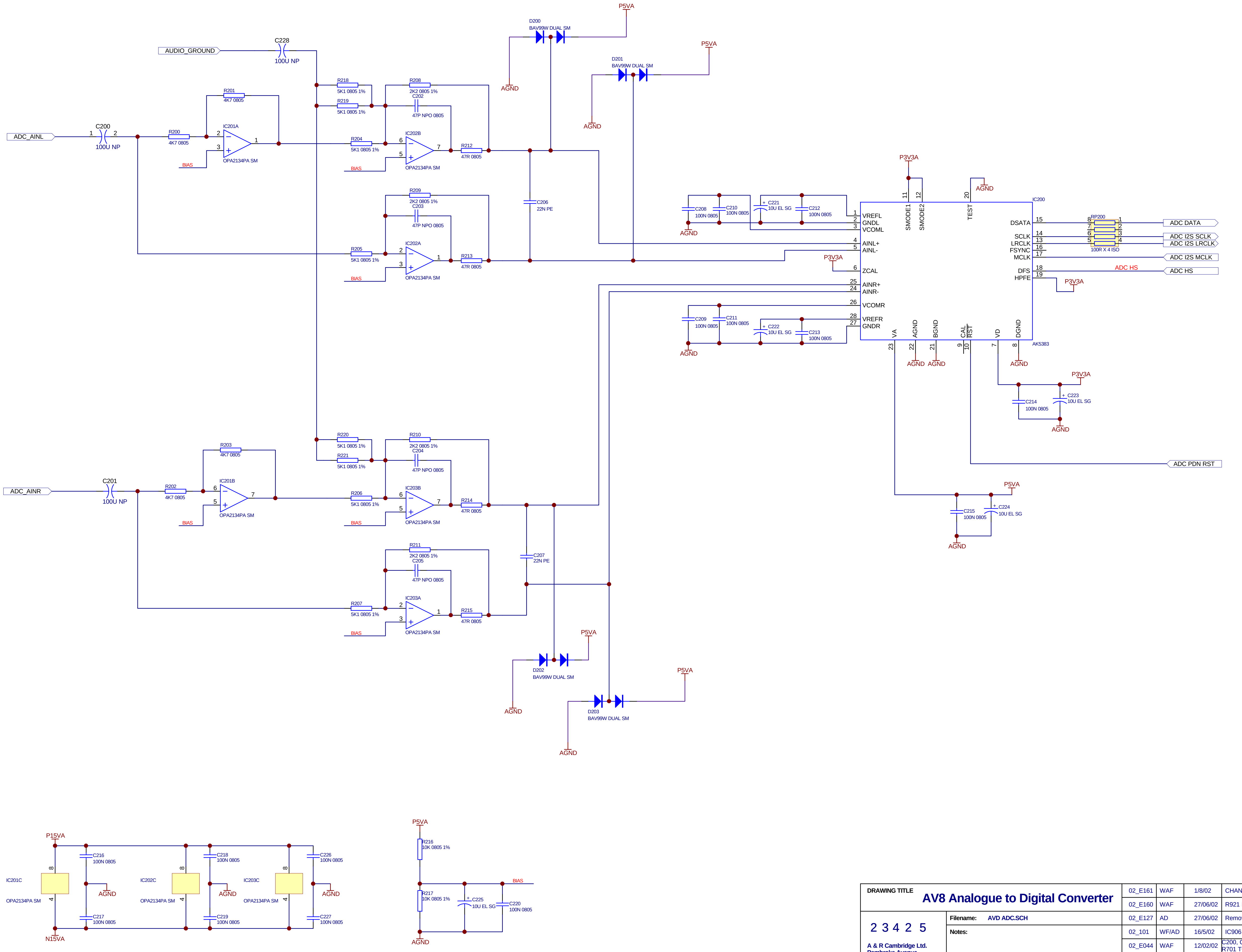




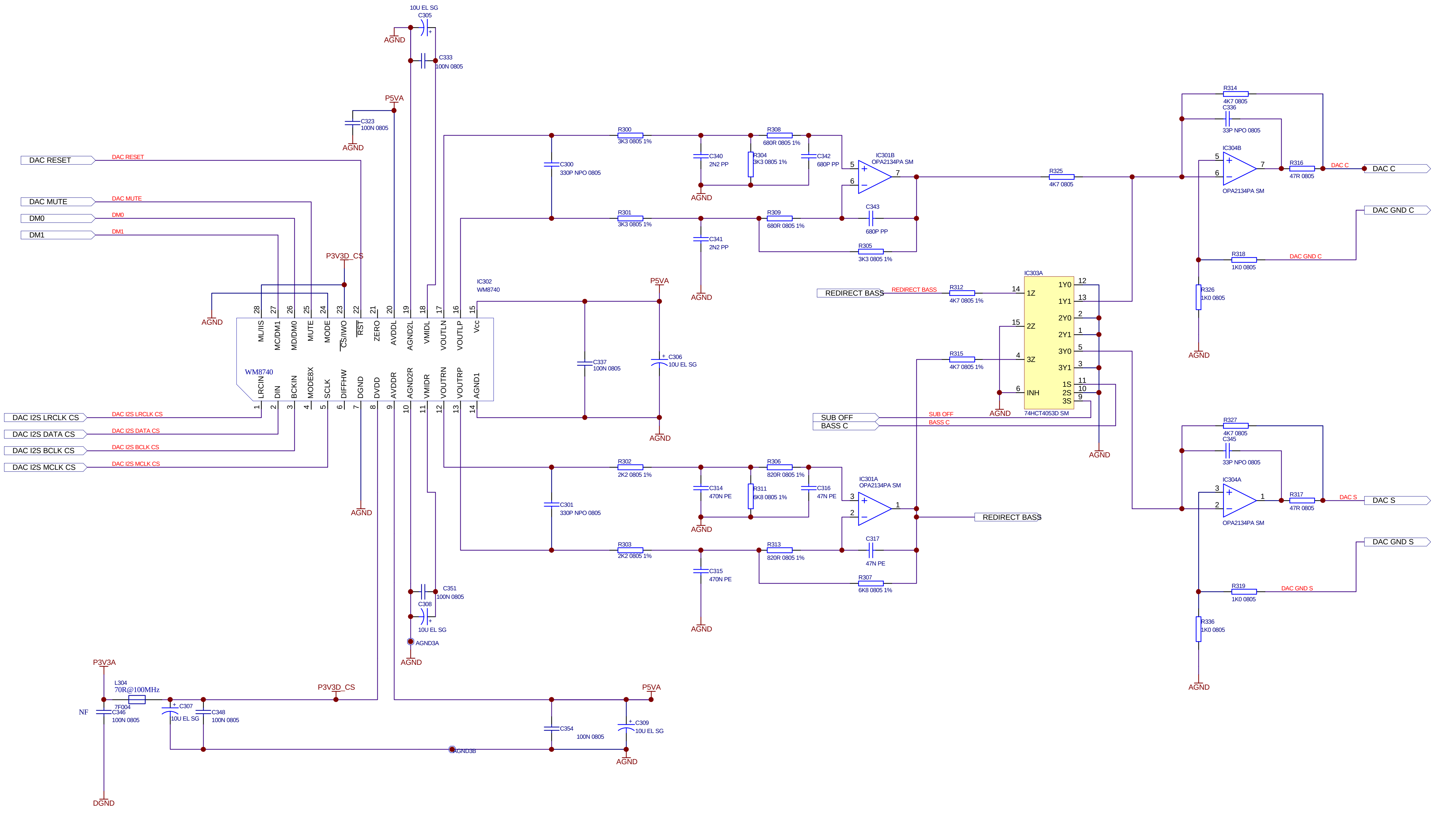
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2 3 4 2 5	Filename: L896CT_1.6.0.sch	02_E127	AD	27/06/02	Remove R803 for PLL board upgrade	1.4.0
	Notes:	02_101	WF/AD	16/5/02	IC906 FROM 5G24LC08 TO 5G24LC16 TO GIVE MORE SPACE	1.3.0
		02_E044	WAF	12/02/02	C200, C201 & C228 changed from 10U 35V to 100U 16V R911 TO 10K R701 TO R704 & R708 TO R711 CHANGED TO 3K3 IC104 UPDATED	1.2
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE

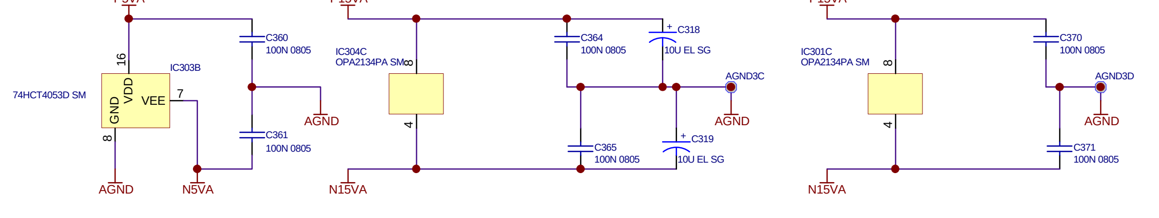
A & R Cambridge Ltd.
Pembroke Avenue
Waterbeach
Cambridge CB5 9PB

Contact Engineer: EngName A Dutton | Contact Tel: (01223) 203200 | Printed: 1-Aug-2002 | Sheet 1 of 11 | DRAWING NO. L896CT



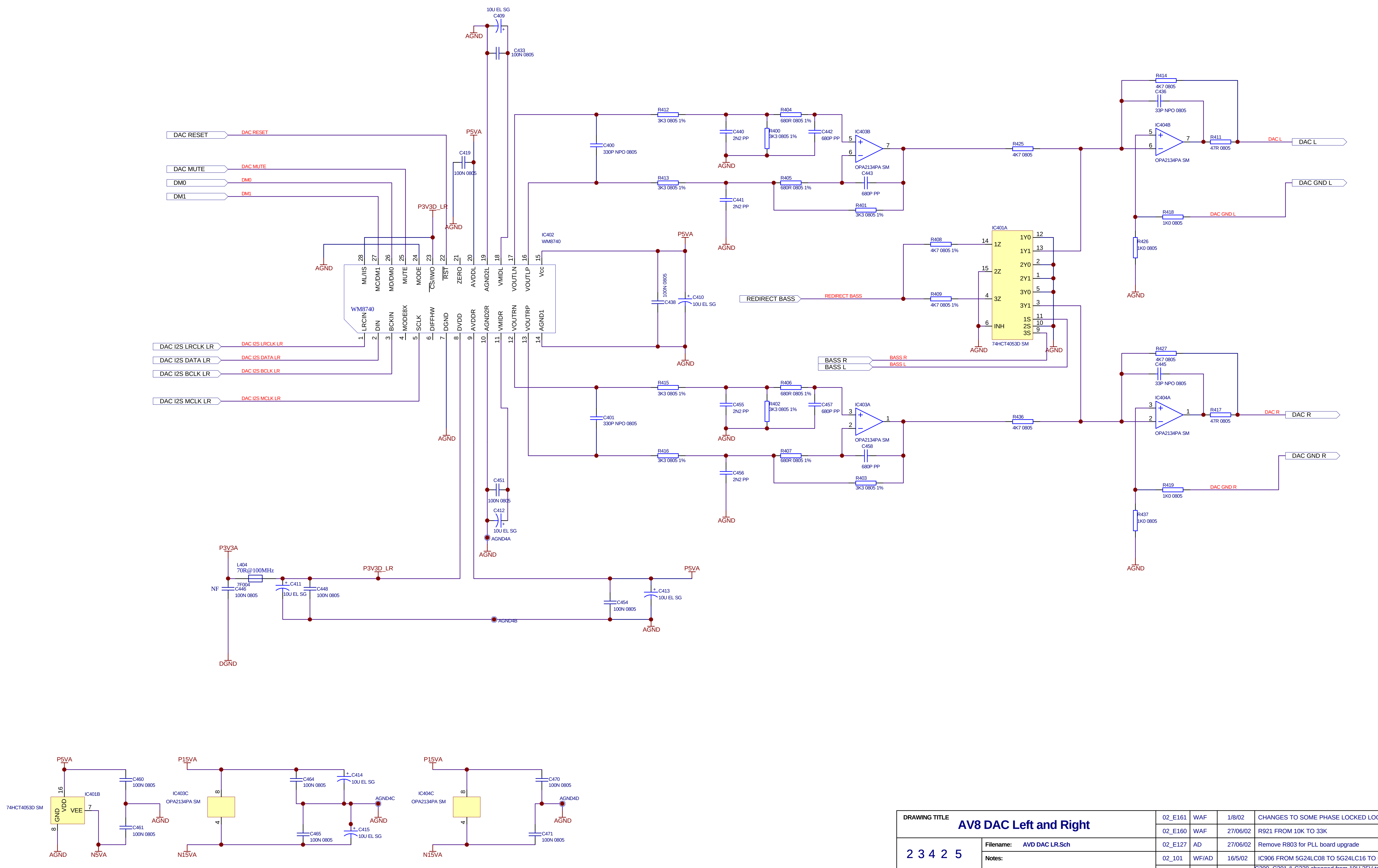
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		02_E161	WAF	1/8/02	CHANGES TO SOME PHASE LOCKED LOOP COMPS AND IC907	1.6.0
		02_E160	WAF	27/06/02	R921 FROM 10K TO 33K	1.5.0
2 3 4 2 5	Filename: AVD ADC.SCH	02_E127	AD	27/06/02	Remove R803 for PLL board upgrade	1.4.0
	Notes:	02_101	WF/AD	16/5/02	IC906 FROM 5G24LC08 TO 5G24LC16 TO GIVE MORE SPACE	1.3.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB		02_E044	WAF	12/02/02	C200, C201 & C228 changed from 10U 35V to 100U 16V R911 TO 10K R701 TO R704 & R708 TO R711 CHANGED TO 3K3 IC104 UPDATED	1.2
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
	Contact Engineer: EngName A Dutton — Contact Tel: (01223) 203200	Printed: 1-Aug-2002		Sheet 2 of 11	DRAWING NO. L896CT	



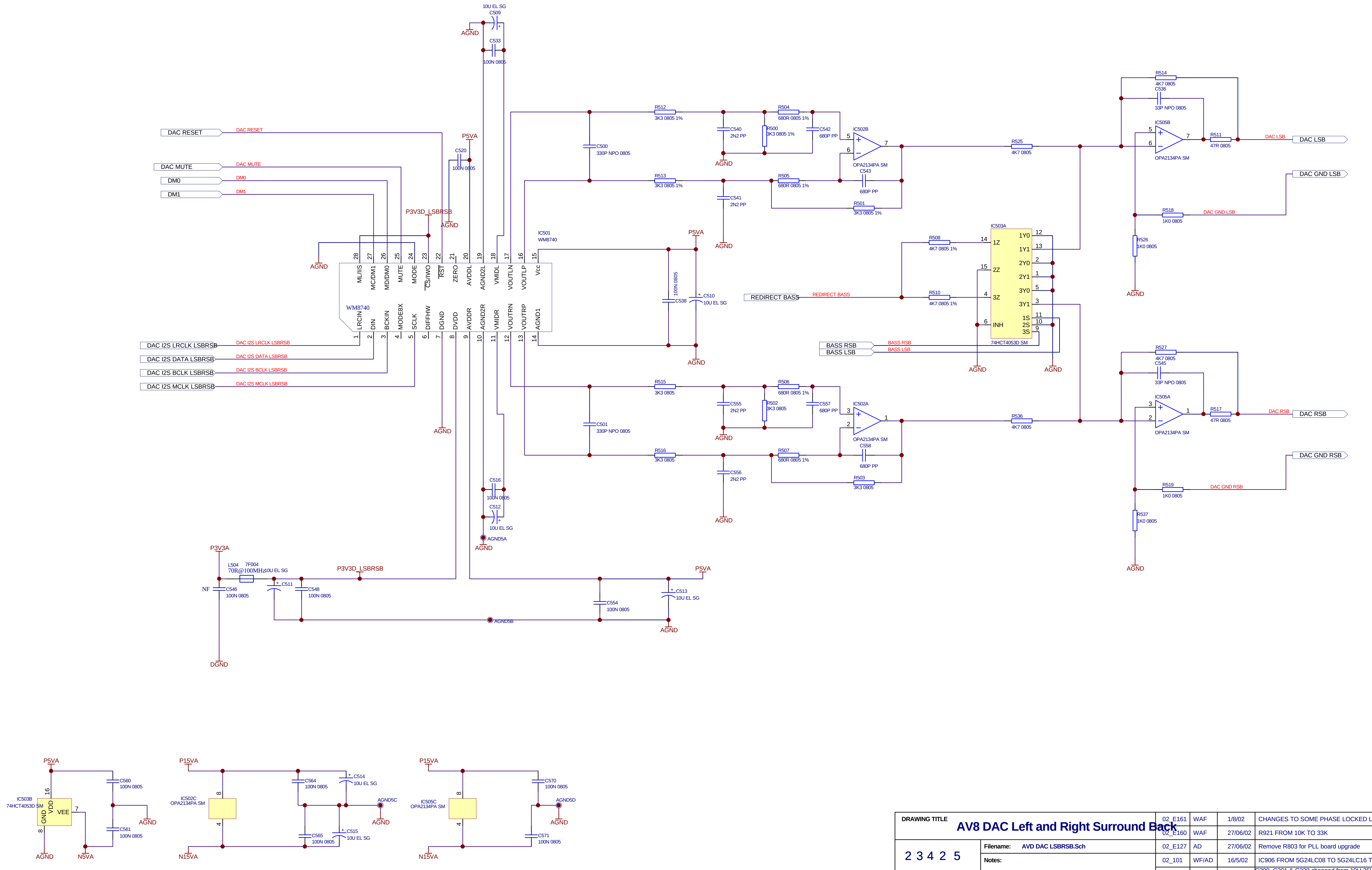


DRAWING TITLE	AV8 DAC Centre and Sub	02_E161	WAF	1/8/02	CHANGES TO SOME PHASE LOCKED LOOP COMPS AND IC907	1.6.0
		02_E160	WAF	27/06/02	R921 FROM 10K TO 33K	1.5.0
2 3 4 2 5	Filename: AVD DAC CS.Sch	02_E127	AD	27/06/02	Remove R803 for PLL board upgrade	1.4.0
	Notes:	02_101	WF/AD	16/5/02	IC906 FROM 5G24LC08 TO 5G24LC16 TO GIVE MORE SPACE	1.3.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB		02_E044	WAF	12/02/02	C200, C201 & C228 changed from 10U 35V to 100U 16V R911 TO 10K R701 TO R704 & R708 TO R711 CHANGED TO 3K3 IC104 UPDATED	1.2
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE

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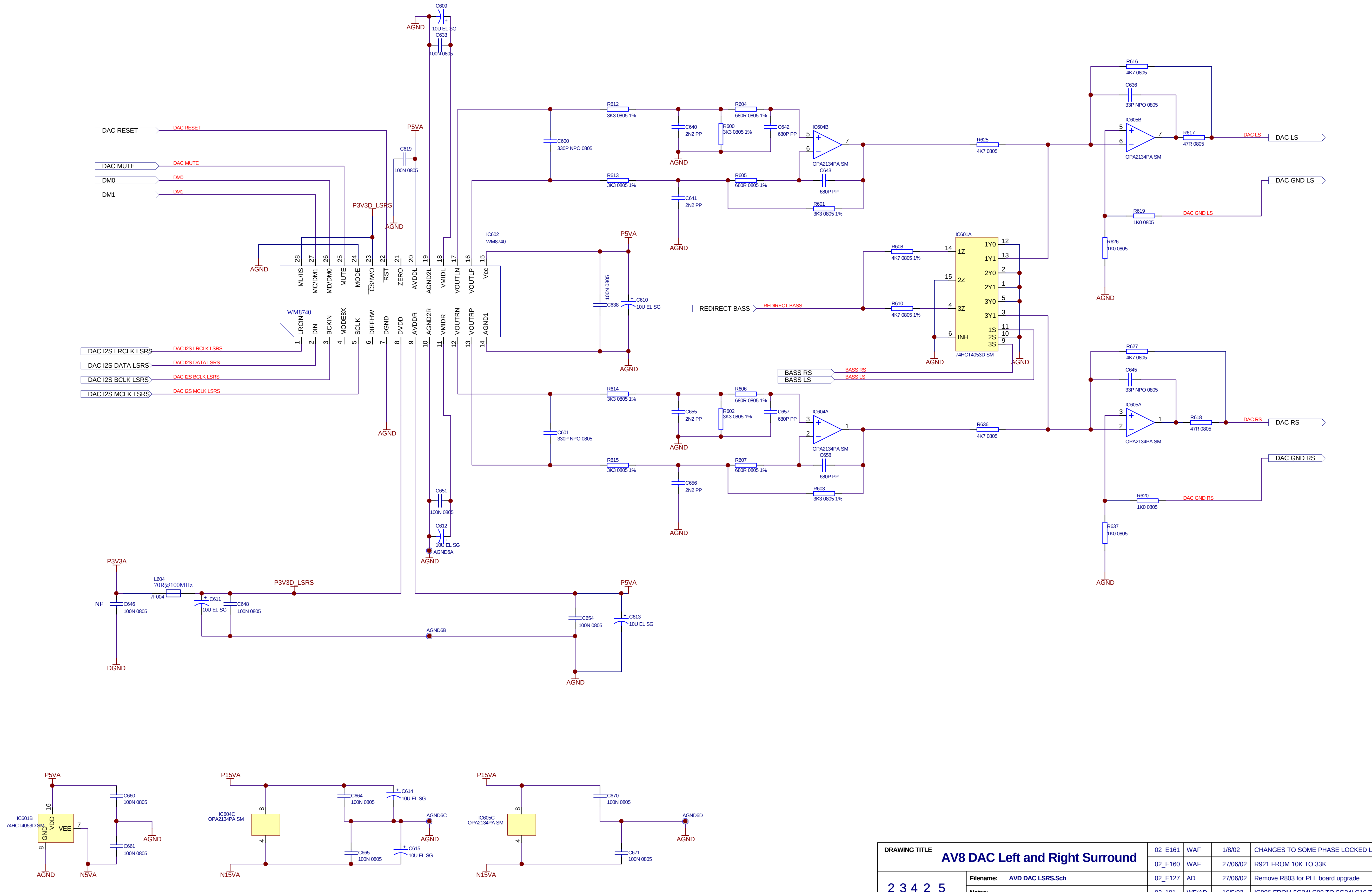


DRAWING TITLE AV8 DAC Left and Right		02_E161	WAF	1/8/02	CHANGES TO SOME PHASE LOCKED LOOP COMPS AND IC907	1.6.0
		02_E160	WAF	27/06/02	R921 FROM 10K TO 33K	1.5.0
2 3 4 2 5	Filename: AVD DAC LR.Sch	02_E127	AD	27/06/02	Remove R803 for PLL board upgrade	1.4.0
	Notes:	02_101	WF/AD	16/5/02	IC906 FROM 5G24LC08 TO 5G24LC16 TO GIVE MORE SPACE	1.3.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB		02_E044	WAF	12/02/02	C200, C201 & C228 changed from 10U 35V to 100U 16V R911 TO 10K R701 TO R704 & R708 TO R711 CHANGED TO 3K3 IC104 UPDATED	1.2
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
Contact Engineer: EngName A Dutton	Contact Tel: (01223) 203200	Printed: 1-Aug-2002		Sheet 4 of 11	DRAWING NO. L896CT	



DRAWING TITLE	AV8 DAC Left and Right Surround Back	ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
		02_E161	WAF	1/8/02	CHANGES TO SOME PHASE LOCKED LOOP COMPS AND IC907	1.6.0
		02_E160	WAF	27/06/02	R921 FROM 10K TO 33K	1.5.0
2 3 4 2 5	Filename: AVD DAC LSBRSB.Sch	02_E127	AD	27/06/02	Remove R803 for PLL board upgrade	1.4.0
	Notes:	02_101	WF/AD	16/5/02	IC906 FROM 5G24LC08 TO 5G24LC16 TO GIVE MORE SPACE	1.3.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB		02_E044	WAF	12/02/02	C200, C201 & C228 changed from 10U 35V to 100U 16V R911 TO 10K R701 TO R704 & R708 TO R711 CHANGED TO 3K3 IC104 UPDATED	1.2

Contact Engineer: EngName A Dutton | Contact Tel: (01223) 203200 | Printed: 1-Aug-2002 | Sheet 5 of 11 | DRAWING NO. L896CT

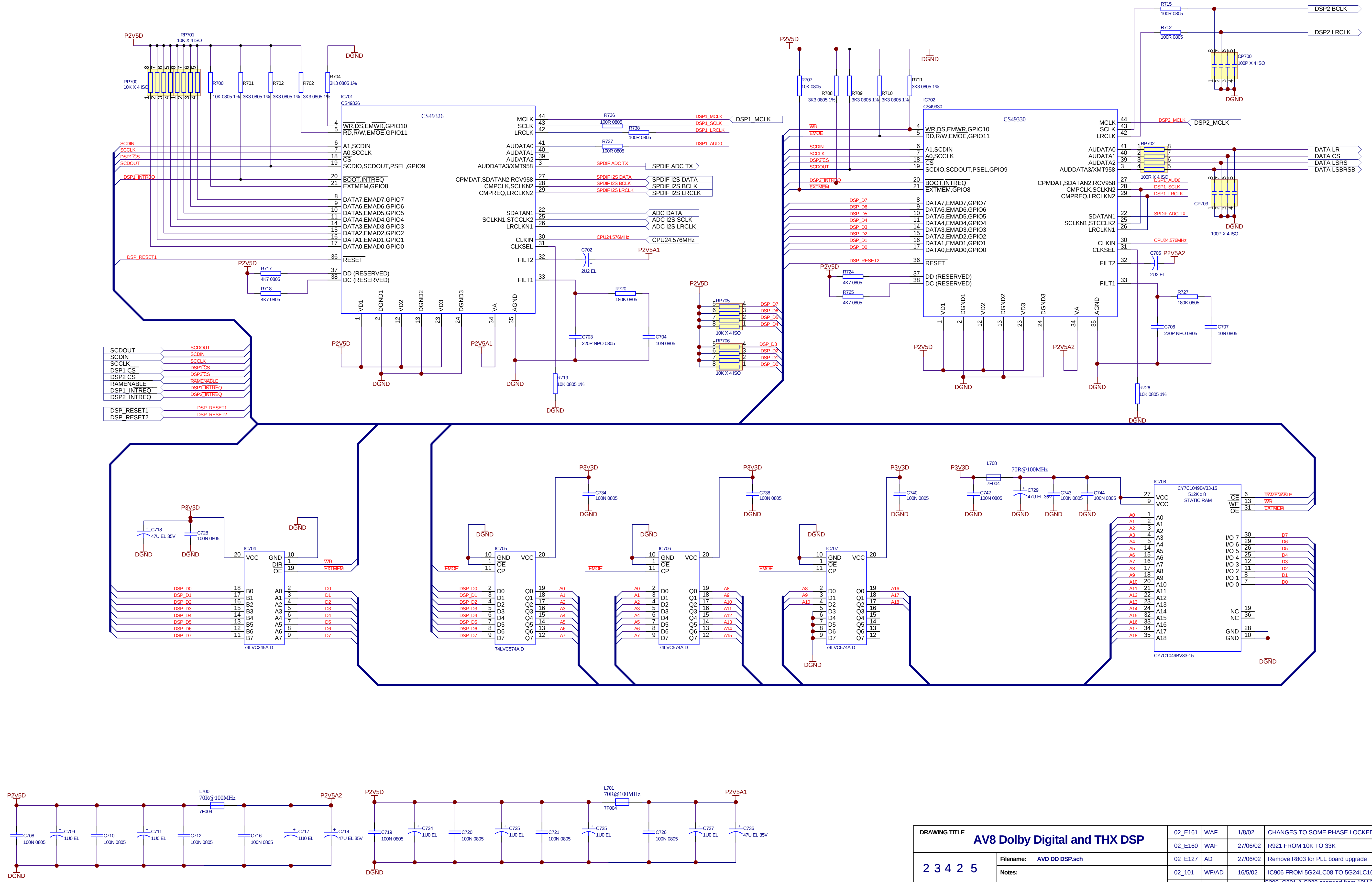


DRAWING TITLE **AV8 DAC Left and Right Surround**	02_E161	WAF	1/8/02	CHANGES TO SOME PHASE LOCKED LOOP COMPS AND IC907	1.6.0
	02_E160	WAF	27/06/02	R921 FROM 10K TO 33K	1.5.0
Filename: AVD DAC LSRS.Sch	02_E127	AD	27/06/02	Remove R803 for PLL board upgrade	1.4.0
Notes:	02_101	WF/AD	16/5/02	IC906 FROM 5G24LC08 TO 5G24LC16 TO GIVE MORE SPACE	1.3.0
	02_E044	WAF	12/02/02	C200, C201 & C228 changed from 10U 35V to 100U 16V R911 TO 10K R701 TO R704 & R708 TO R711 CHANGED TO 3K3 IC104 UPDATED	1.2
	ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE

2 3 4 2 5

A & R Cambridge Ltd.
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Waterbeach
Cambridge CB5 9PB

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DRAWING TITLE

AV8 Dolby Digital and THX DSP

2 3 4 2 5

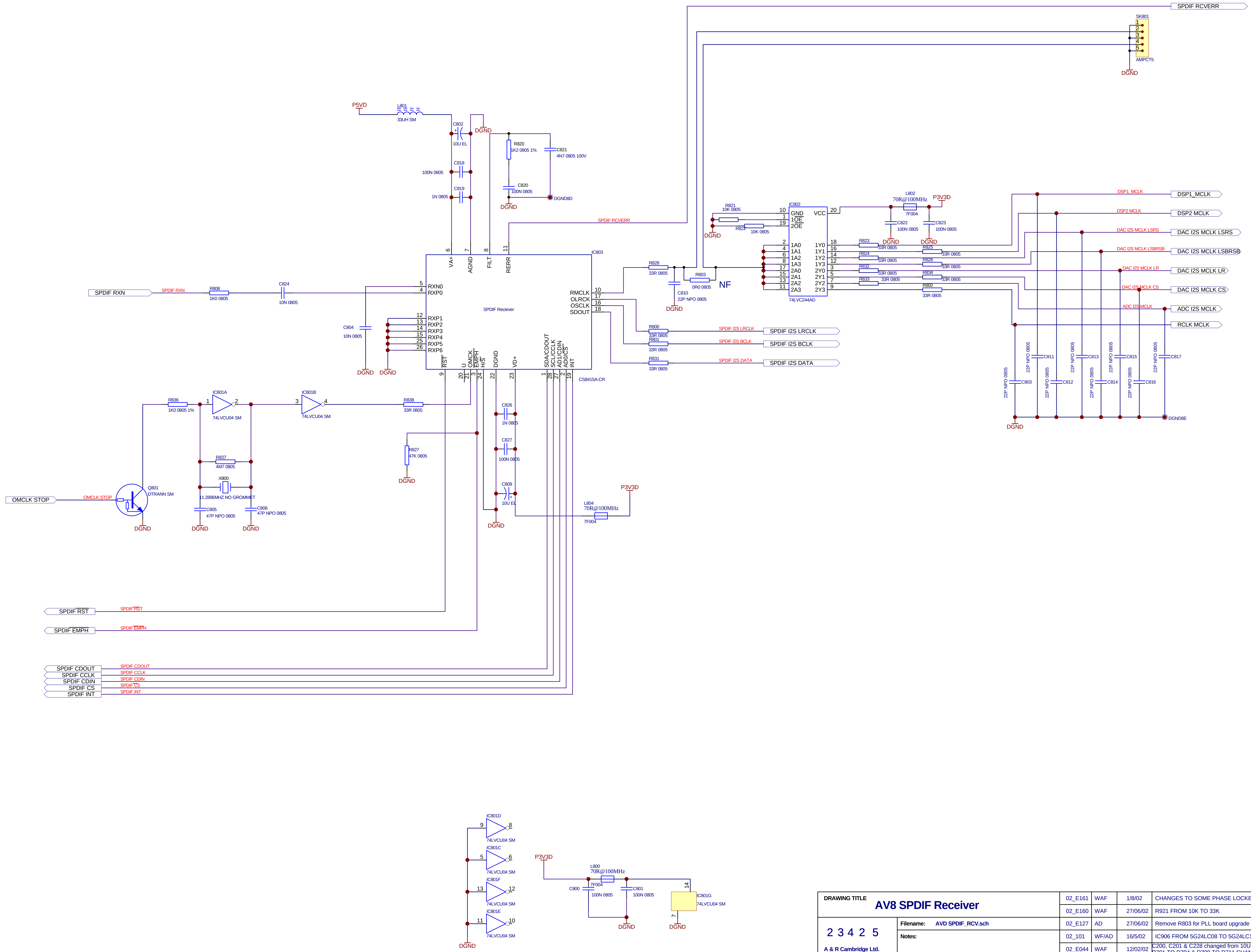
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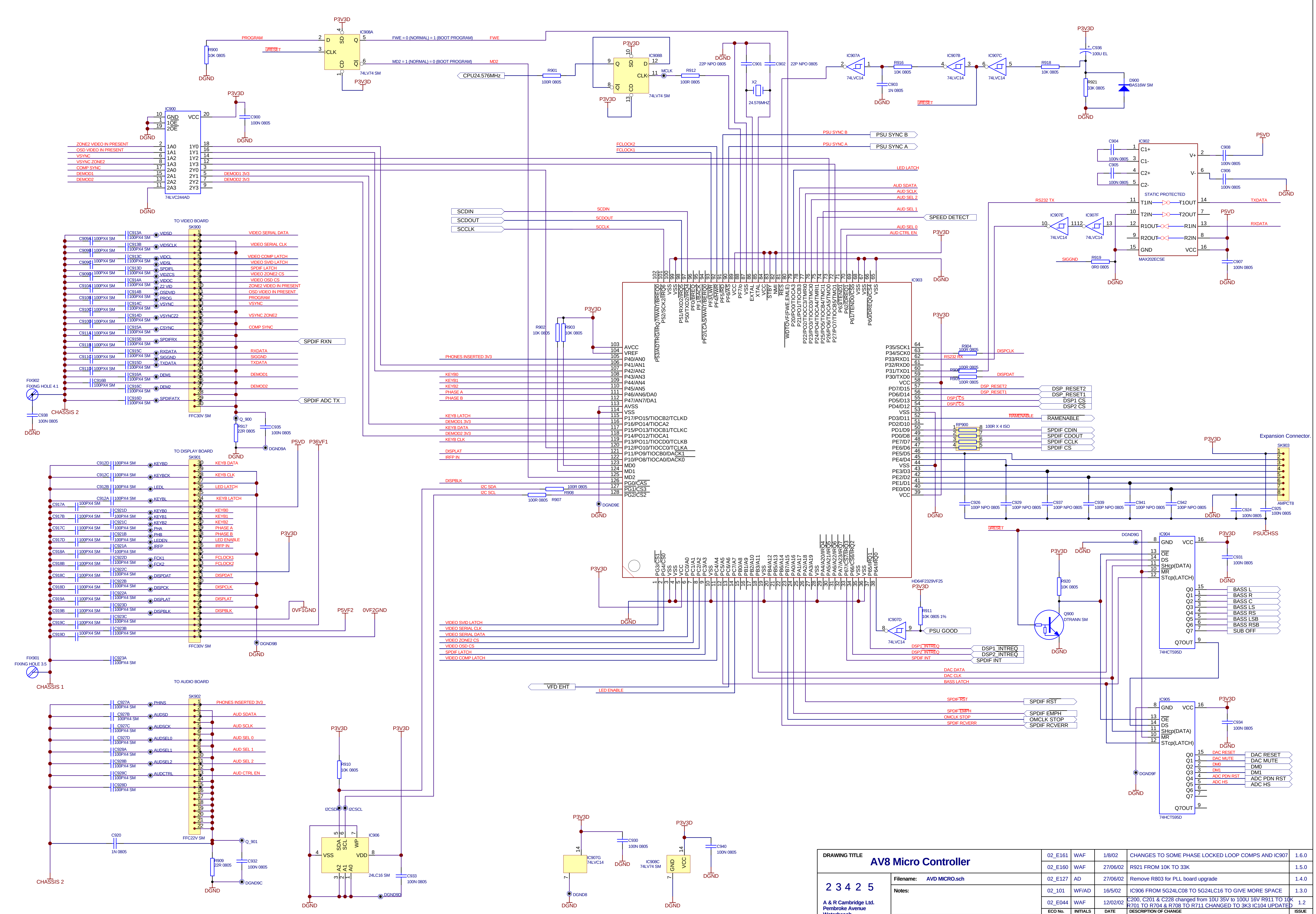
A & R Cambridge Ltd.
Pembroke Avenue
Waterbeach
Cambridge CB5 9PB

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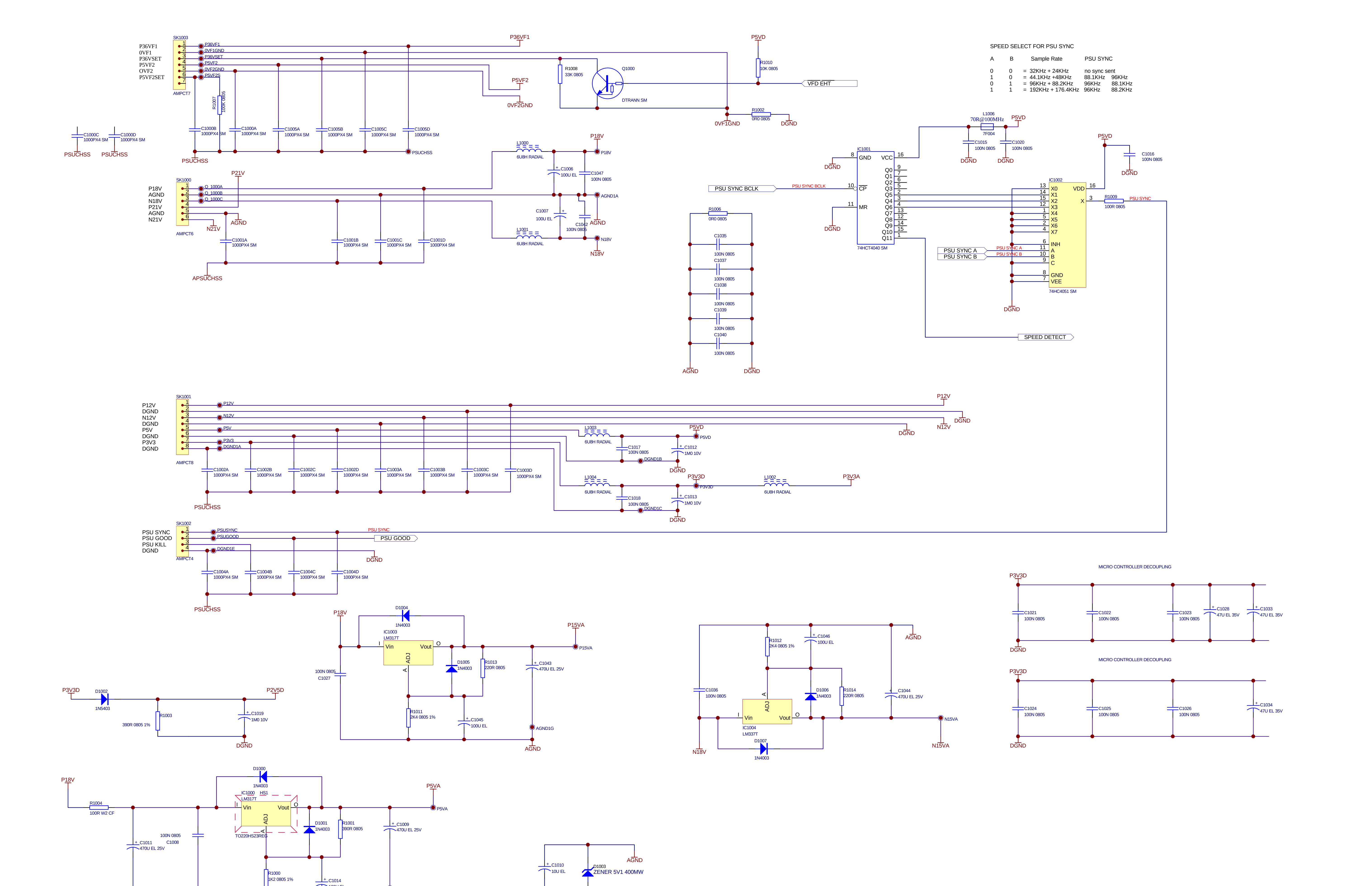
ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
02_E161	WAF	1/8/02	CHANGES TO SOME PHASE LOCKED LOOP COMPS AND IC907	1.6.0
02_E160	WAF	27/06/02	R921 FROM 10K TO 33K	1.5.0
02_E127	AD	27/06/02	Remove R803 for PLL board upgrade	1.4.0
02_101	WF/AD	16/5/02	IC906 FROM 5G24LC08 TO 5G24LC16 TO GIVE MORE SPACE	1.3.0
02_E044	WAF	12/02/02	C200, C201 & C228 changed from 10U 35V to 100U 16V R911 TO 10K R701 TO R704 & R708 TO R711 CHANGED TO 3K3 IC104 UPDATED	1.2



DRAWING TITLE: AV8 SPDIF Receiver		02_E161	WAF	1/8/02	CHANGES TO SOME PHASE LOCKED LOOP COMPS AND IC907	1.6.0
		02_E160	WAF	27/06/02	R921 FROM 10K TO 33K	1.5.0
2 3 4 2 5	Filename: AVD SPDIF_RCV.sch	02_E127	AD	27/06/02	Remove R803 for PLL board upgrade	1.4.0
	Notes:	02_101	WF/AD	16/5/02	IC906 FROM 5G24LC08 TO 5G24LC16 TO GIVE MORE SPACE	1.3.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB		02_E044	WAF	12/02/02	C200, C201 & C228 changed from 10U 35V to 100U 16V R911 TO 10K R701 TO R704 & R708 TO R711 CHANGED TO 3K3 IC104 UPDATED	1.2
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
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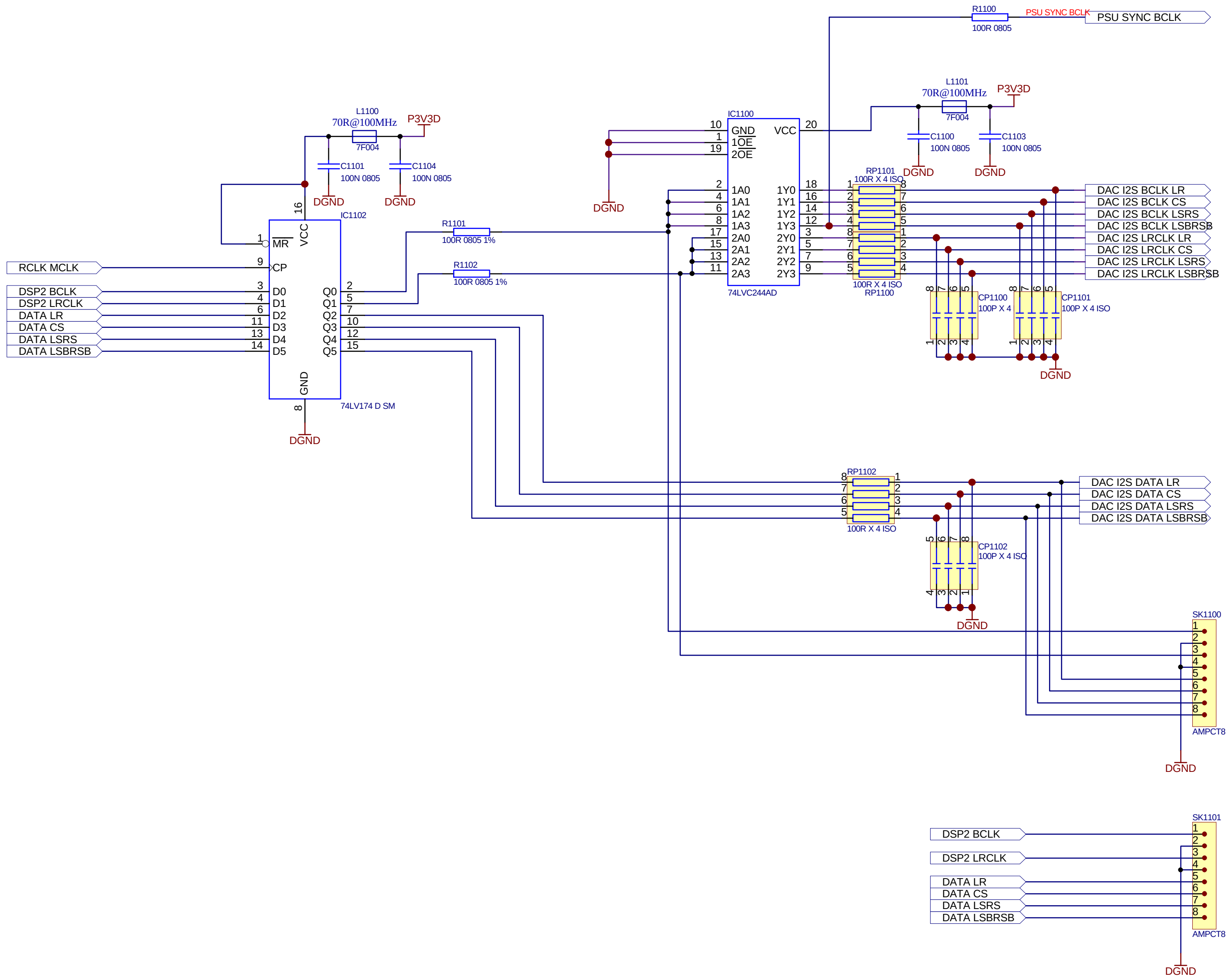


DRAWING TITLE	AV8 Micro Controller		02_E161	WAF	1/8/02	CHANGES TO SOME PHASE LOCKED LOOP COMPS AND IC907	1.6.0
			02_E160	WAF	27/06/02	R921 FROM 10K TO 33K	1.5.0
2 3 4 2 5	Filename: AVD MICRO.sch		02_E127	AD	27/06/02	Remove R803 for PLL board upgrade	1.4.0
	Notes:		02_101	WF/AD	16/5/02	IC906 FROM 5G24LC08 TO 5G24LC16 TO GIVE MORE SPACE	1.3.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB			02_E044	WAF	12/02/02	C200, C201 & C228 changed from 10U 35V to 100U 16V R911 TO 10K R701 TO R704 & R708 TO R711 CHANGED TO 3K3 IC104 UPDATED	1.2
			ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
	Contact Engineer: EngName A Dutton	Contact Tel: (01223) 203200	Printed: 1-Aug-2002		Sheet 9 of 11	DRAWING NO. L896CT	



DRAWING TITLE		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
AV8 Digital Board Power Supply		02_E161	WAF	1/8/02	CHANGES TO SOME PHASE LOCKED LOOP COMPS AND IC907	1.6.0
		02_E160	WAF	27/06/02	R921 FROM 10K TO 33K	1.5.0
2 3 4 2 5	Filename: AVD PSU.Sch	02_E127	AD	27/06/02	Remove R803 for PLL board upgrade	1.4.0
	Notes:	02_101	WF/AD	16/5/02	IC906 FROM 5G24LC08 TO 5G24LC16 TO GIVE MORE SPACE	1.3.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB		02_E044	WAF	12/02/02	C200, C201 & C228 changed from 10U 35V to 100U 16V R911 TO 10K R701 TO R704 & R708 TO R711 CHANGED TO 3K3 IC104 UPDATED	1.2

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DRAWING TITLE	AV8 Reclocking	ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
		02_E161	WAF	1/8/02	CHANGES TO SOME PHASE LOCKED LOOP COMPS AND IC907	1.6.0
		02_E160	WAF	27/06/02	R921 FROM 10K TO 33K	1.5.0
2 3 4 2 5	Filename: AVD RECLOCKING.SCH	02_E127	AD	27/06/02	Remove R803 for PLL board upgrade	1.4.0
	Notes:	02_101	WF/AD	16/5/02	IC906 FROM 5G24LC08 TO 5G24LC16 TO GIVE MORE SPACE	1.3.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB		02_E044	WAF	12/02/02	C200, C201 & C228 changed from 10U 35V to 100U 16V R911 TO 10K R701 TO R704 & R708 TO R711 CHANGED TO 3K3 IC104 UPDATED	1.2

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Power Supply Board L897

Contents

- Circuit description
- Component overlay
- Parts list
- Circuit diagrams

AV8 Power Supply Board

The 40W Resonant supply is designed to produce extremely low levels of conducted and radiated noise. The supply is based around a discontinuous inductor current single ended flyback topology with active clamp. The active clamp eliminates the power losses normally associated with RCD type clamps and also eliminates the high voltage ringing waveform normally present on the primary inductance. In addition current is transferred to the output capacitors as a half wave sinusoid rather than a triangle wave which would normally be expected from a flyback supply. The sinusoidal current waveform into the output capacitors results in reduced output noise with attenuated high frequency response.

The PSU provides the following functionality

- Universal input voltage range 85V ac rms to 265V ac rms.
- Eight regulated supply rails.

The output voltages are provided as 3 groups of supplies.

- Digital supplies

The digital supplies are for use on non audio circuits e.g microprocessor and similar circuitry, they are referenced to DGND.

Digital supply rails	Voltage tolerance	Max current
+3V3	3%	1.5A
+5V	3%	1A
+12V	12.9V 5%	500mA
-12V	12.9V 5%	500mA

- Analogue supplies

The analogue supplies are for use on audio circuitry, they are referenced to AGND.

Analogue supply rails	Voltage tolerance	Max current
+20.8V	5%	300mA
-20.8V	5%	300mA
+18V	2%	300mA
-18V	2%	300mA

Note. The rated supply currents for the analogue supplies are 300mA per rail. The +18V and –18V supplies are provided by 3 terminal regulators which derive their current from the +21V and –21V rails. The current ratings can thus be written.

Sum of output current from +21V and +18V = 0.3A max
Sum of output current from -21V and -18V = 0.3A max

AGND and DGND are joined together at 1 place on the PSU (LK1)

- Adjustable supplies
    - +40V (adjustable)
    - +7V5 (adjustable))

Adjustable supply rails	Max current
+21V	30mA
5V	150mA

These supplies are floating to allow them to be configured as positive or negative supplies to suit the particular display used.
The outputs are semi-regulated by a zener/emitter follower circuit. The Output voltages my be trimmed by addition of resistors between the lines +40V_SET and +5V_SET.

Note. The +40V rail was originally to be set to +36V as marked on the drawings but it was found that the display was to bright and subsequently has been adjusted to +21V.

External Synchronisation Input

The free running frequency of the PSU is around 75KHz.
For applications which require synchronisation to a system clock, the PSU may be entrained to an applied Sync signal. The Sync signal should be between 85KHz and 100KHz. The Sync signal is applied via line SYNC (SK8-1) and should be a TTL level 50%duty cycle square wave.

External PSU Kill Signal

For applications which require a means of shutting down the PSU (e.g. in the event of a detected fault scenario) then PSU latched shutdown may be initiated by pulling and holding line PSUKILL* to DGND. The PSU will enter a latched shutdown state after around 1second. The Latched shutdown forces all output supplies to 0V and can be defeated only by removing the mains input to the PSU for >15seconds.

Under-voltage lockout

The PSU is protected against the input voltage being too low (which would otherwise cause the input current to be excessive for a given output power). In the event of the input voltage being <75V ac rms then the PSU control IC will disable gate drive signals and the PSU output voltages will fall to zero.

Output Over-voltage Protection

The output voltages are monitored and in the event of the output voltages rising approx 15% above specified limits for >0.5 seconds then a latched shutdown event will be triggered. This mechanism is not intended to protect sensitive components from damaging transients but is intended to protect the PSU and its load in the event of the feedback signal failure.

In this design both the 3V3 and +5V are sensed. In the event of a failure in e.g. the 5V rail then the feedback loop will try to make the other rail voltage high enough to supply all of the feedback current which the other, now broken, supply was formerly contributing toward. This would normally force the 3V3 supply to more than twice its expected value (and all of the other supplies would be multiplied by the same factor). The provided mechanism prevents this eventuality.

Feedback loop failure protection

In the event of the feedback loop failing (eg. due to a broken feedback component) then the supply will enter latched shutdown after around 1 second.

Overcurrent Protection

A number of mechanisms protect the PSU in the event of a short circuit or very high load being placed on one of the outputs.

The PSU has a power limit of around 45W. If an attempt is made to draw more power than this then the PSU will power limit. This will show up as a reduction in the output voltages. This will in turn force the feedback loop to attempt to demand more power throughput to correct the low output voltages. The feedback signal will then trigger the feedback loop failure mechanism which will then force the PSU into latched shutdown if this persists for more than around 1second.

Mains Present Signal

The PSU provides a signal MAINSOK* (active low when mains supply is OK). This signal is provided as an open collector signal from SK8-2. The signal will go high (via a pull-up resistor external to the PSU) when the mains supply is removed and will then provide > around 20mS warning of the imminent collapse of the output rails.

The actual time between the rising edge of MAINSOK* and the output voltage rails falling out of spec is dependent on mains input voltage and output load current. The output voltages will hold up longer when the load current is low and the mains input is high. The 20mS hold up spec is based on low mains voltage and full load.

Inrush current protection

The PSU has an NTC in series with the input reservoir capacitor. When the supply is first powered up the NTC is cold and exhibits a resistance of around 25Ohms which limits the current into the capacitor and prevents damage to the capacitor, fuses and mains switch. After several seconds the NTC temperature rises to around 90C and the resistance falls to a low value allowing normal operation.

PSU Over-temperature Protection

The PSU transformer is fitted with a one shot thermal fuse. This opens at 120C and removes the supply to the primary side controller. The thermal trip is taped to the outside of the transformer so that it could in principal be changed. The materials from which the transformer is constructed are rated for operation at 130C and in normal operation the TX surface temperature is < 90C.

Figure 1

This diagram shows a very simplified PSU block diagram. Only one output is shown and the active clamp is omitted.

The basis operation is as follows.

At the beginning of the switching cycle the gate drive signal to M2 goes high. M2 is turned ON and the voltage across C35 is applied across the primary of L1. During this stage the voltage on the anode of Dout is negative the diode is reverse biased and no current flows in the secondary winding. The voltage applied across the primary causes the current in L1 primary to ramp up from zero. When the control circuit turns off M2 by taking gate drive low then the bottom of the inductor flies back above the input voltage . This flyback action causes the output diode Dout to conduct and current is transferred to the output capacitor Cout.

Figure 2

These waveforms are for a non resonant ordinary discontinuous flyback supply to illustrate the operation of the circuit. The drain waveform starts at the voltage on the input capacitor C35 and falls to near zero when the mosfet is switched on. When the mosfet is switched off the drain voltage flies above the input voltage and produces the ringing waveform as shown. The current then ramps down into Cout. When the current has fallen to zero there is again some ringing. The frequency of the ringing is dependent on circuit parasitics.

The primary current can be viewed by looking at the voltage across R30. The output diode current can be measured by using a current probe around Dout or inferred by looking at the voltage waveform across Cout. The falling ramp should produce a small voltage ramp across the ESR of Cout.

By considering the simplified circuit it can be seen that all of the output rails are developed in the same way. The output diodes provide current to the large reservoir capacitors on each rail.

Figure 1

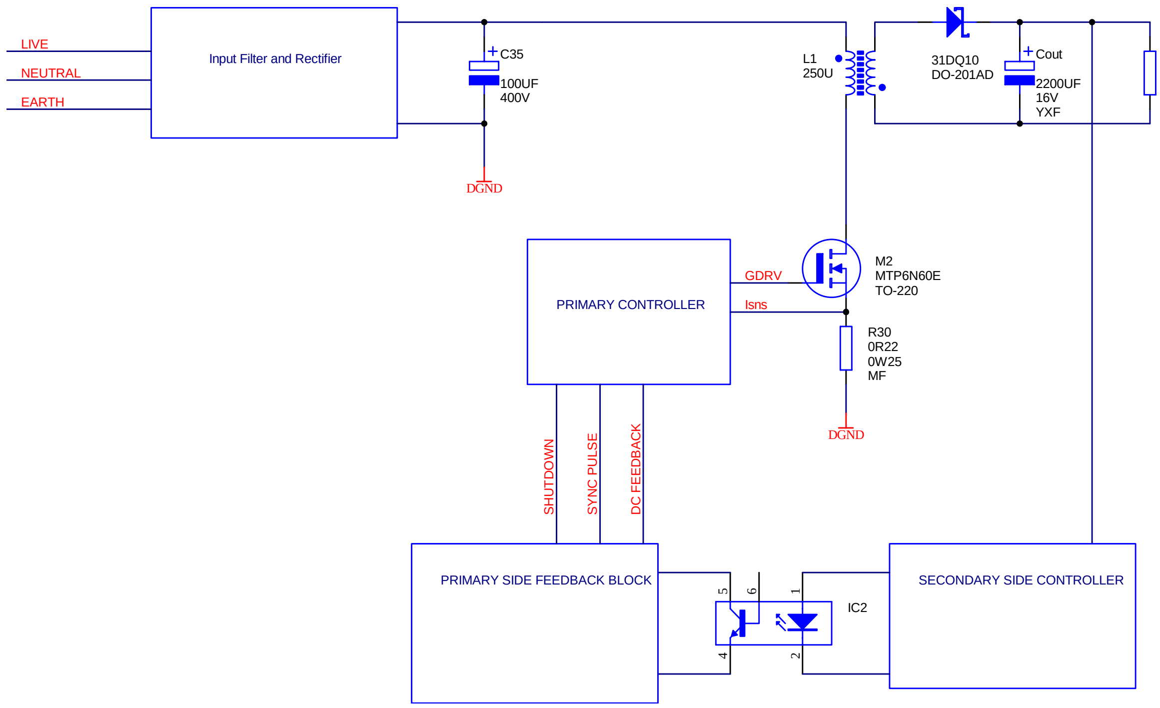
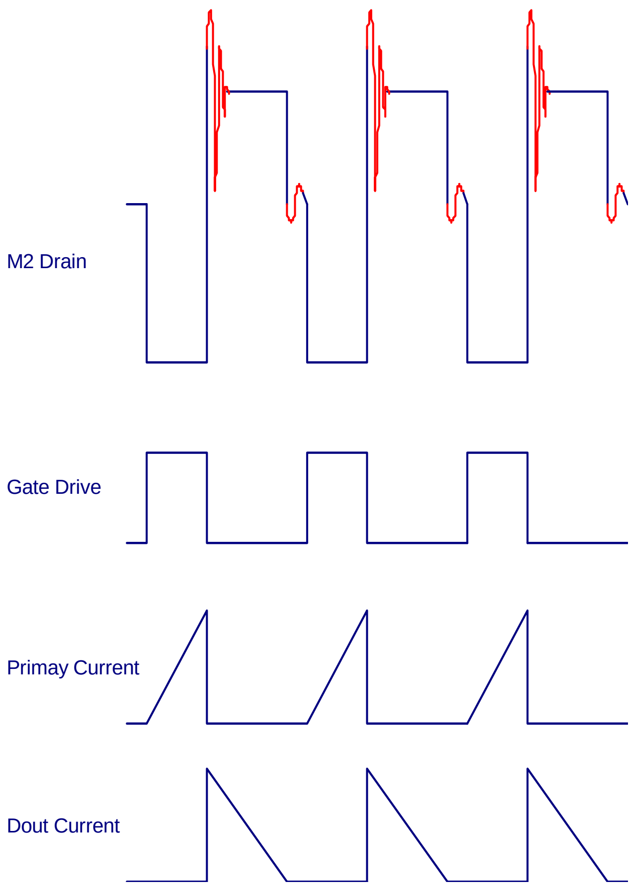
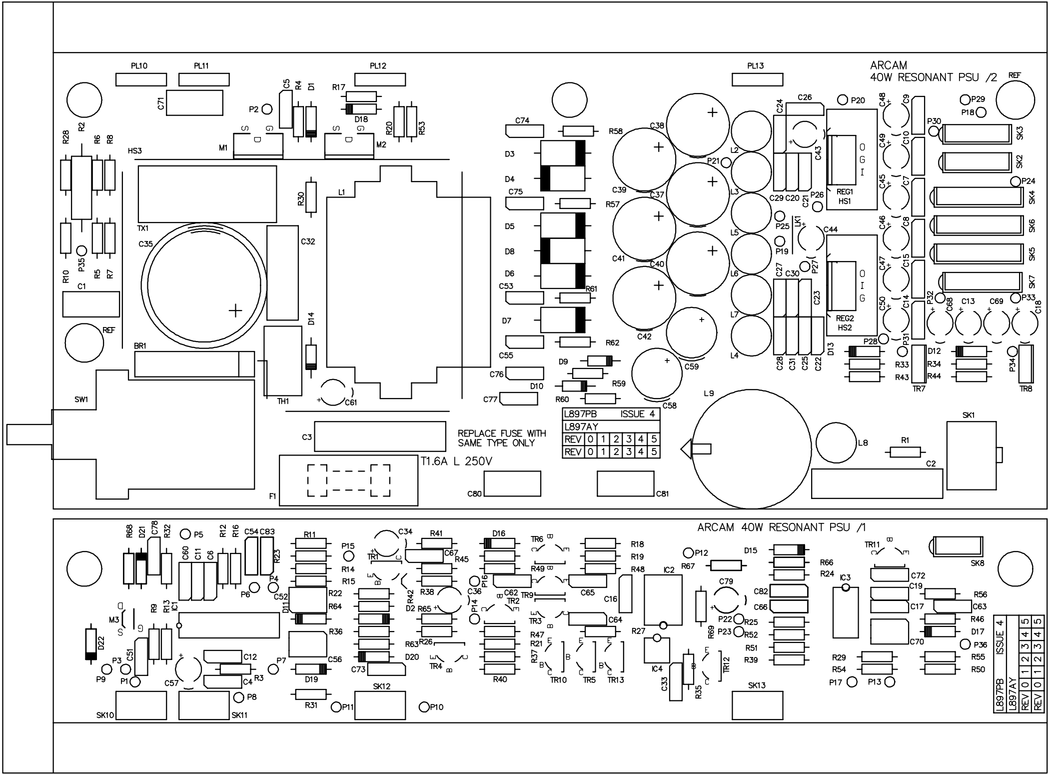


Figure 2





ARCAM
40W RESONANT PSU /2
REPLACE FUSE WITH
SAME TYPE ONLY
T1.6A L 250V
L897PB ISSUE 4
L897AY
REV 0 1 2 3 4 5
REV 0 1 2 3 4 5
ARCAM 40W RESONANT PSU /1
L897PB ISSUE 4
L897AY
REV 0 1 2 3 4 5
REV 0 1 2 3 4 5

L897 Power Supply Parts List Issue 4.1

Designator	Part	Description
BR1	3BGBU4K	Diode Bridge Rectifier GBU4K Plastic Package 4A 800V
C1	2K233	Capacitor X1 Y2 RATED Ceramic 7.5mm Pitch 3N3 250V
C2	2D422	Capacitor X2 Boxed Polypropylene 22.5mm Pitch 275V 220NF
C3	2D422	Capacitor X2 Boxed Polypropylene 22.5mm Pitch 275V 220NF
C4	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C5	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C6	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C7	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C8	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C9	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C10	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C11	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C12	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C13	2N622	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 22UF 63V
C14	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C15	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C16	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C17	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C18	2N622	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 22UF 63V
C19	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C20	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C21	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C22	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C23	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C24	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C25	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C26	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C27	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C28	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C29	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C30	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C31	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C32	2Y410	Capacitor Radial Boxed PE Pitch 15mm 100NF 400V
C33	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C34	2N622	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 22UF 63V
C35	2N710F	Capacitor Radial Electrolytic Claw Mount 100UF 400V
C36	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C37	2ZL810C	Capacitor Ultra Low Impedance Radial Electrolytic Dia 12.5mm Pitch 5mm 1000UF 35V
C38	2ZL810C	Capacitor Ultra Low Impedance Radial Electrolytic Dia 12.5mm Pitch 5mm 1000UF 35V
C39	2ZL810C	Capacitor Ultra Low Impedance Radial Electrolytic Dia 12.5mm Pitch 5mm 1000UF 35V
C40	2ZL847	Capacitor Ultra Low Impedance Radial Electrolytic Dia 12.5mm Pitch 5mm 4700UF 10V
C41	2ZL810C	Capacitor Ultra Low Impedance Radial Electrolytic Dia 12.5mm Pitch 5mm 1000UF 35V
C42	2ZL847	Capacitor Ultra Low Impedance Radial Electrolytic Dia 12.5mm Pitch 5mm 4700UF 10V
C43	2N622	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 22UF 63V
C44	2N622	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 22UF 63V
C45	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C46	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C47	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C48	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C49	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C50	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C51	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C52	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C53	2E147	Capacitor High Voltage Ceramic 470PF 1KV
C54	2A122	Capacitor Ceramic 5mm Pitch 50V 10% 220pF
C55	2E147	Capacitor High Voltage Ceramic 470PF 1KV
C56	2D122	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 220P
C57	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C58	2Z710E	Capacitor Low Impedance Radial Electrolytic Dia 10mm Pitch 5mm 100UF 63V
C59	2Z710E	Capacitor Low Impedance Radial Electrolytic Dia 10mm Pitch 5mm 100UF 63V
C60	2A122	Capacitor Ceramic 5mm Pitch 50V 10% 220pF
C61	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V

L897 Power Supply Parts List Issue 4.1

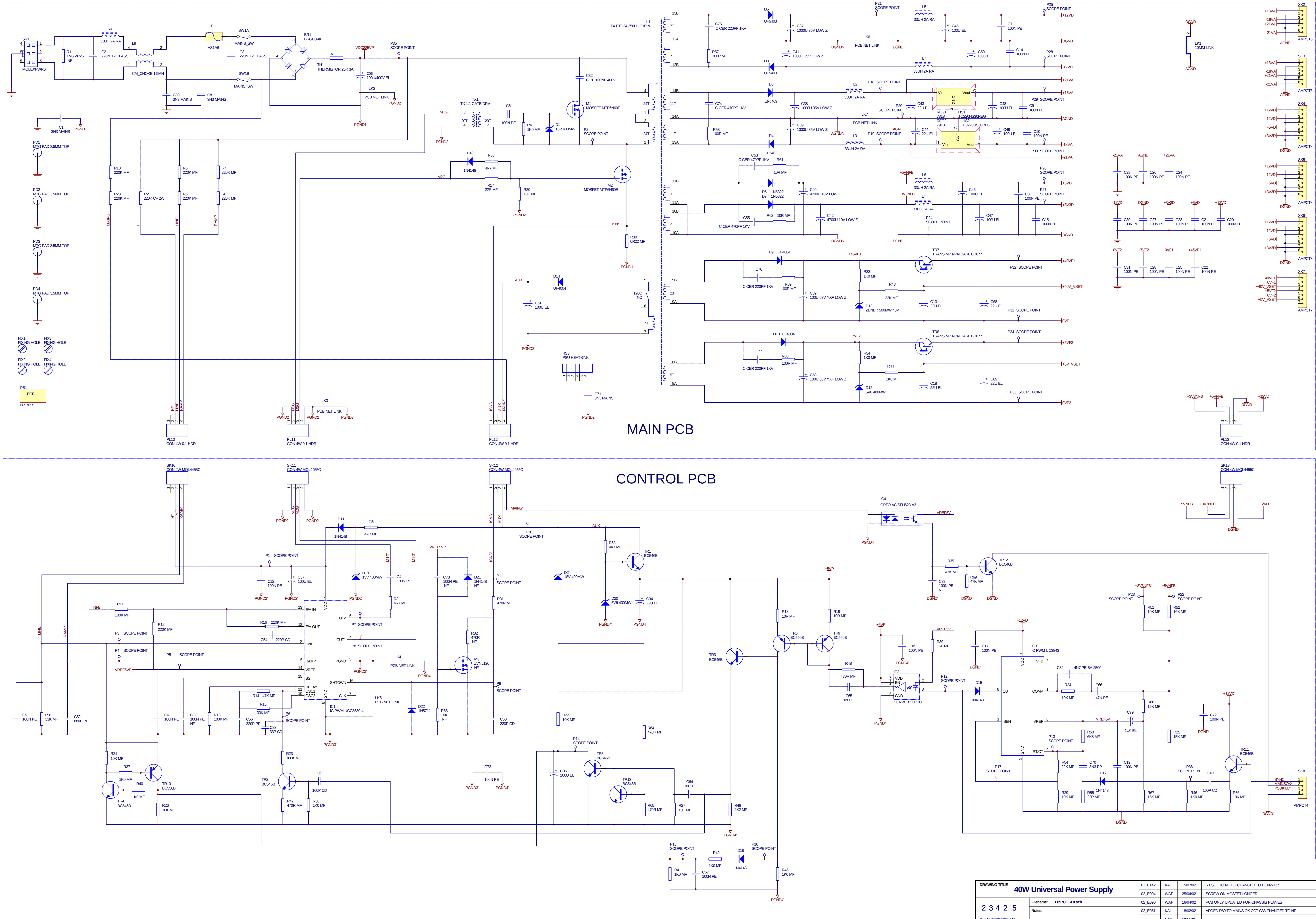
Designator	Part	Description
C62	2A110	Capacitor Ceramic 5mm Pitch 50V 5% 100pF
C63	2A110	Capacitor Ceramic 5mm Pitch 50V 5% 100pF
C64	2K210	Capacitor Boxed Polyester 5mm Pitch 5% 100V 1NF
C65	2K210	Capacitor Boxed Polyester 5mm Pitch 5% 100V 1NF
C66	2K347	Capacitor Boxed Polyester 5mm Pitch 10% 63V 47N
C67	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C68	2N622	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 22UF 63V
C69	2N622	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 22UF 63V
C70	2D233	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 3N3
C71	2K233	Capacitor X1 Y2 RATED Ceramic 7.5mm Pitch 3N3 250V
C72	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C73	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C74	2E147	Capacitor High Voltage Ceramic 470PF 1KV
C75	2E122	Capacitor High Voltage Ceramic 220PF 1KV
C76	2E122	Capacitor High Voltage Ceramic 220PF 1KV
C77	2E122	Capacitor High Voltage Ceramic 220PF 1KV
C78	2K410	Capacitor Boxed Polyester 5mm Pitch 10% 63V 100N
C79	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C80	2K233	Capacitor X1 Y2 RATED Ceramic 7.5mm Pitch 3N3 250V
C81	2K233	Capacitor X1 Y2 RATED Ceramic 7.5mm Pitch 3N3 250V
C82	2K247A	Capacitor Boxed Polyester 5mm Pitch 5% 100V 4N7
C83	2A033	Capacitor Ceramic 5mm Pitch 50V 5% 33pF
D1	3C11504	Zener Diode 0.5W BZX79C15V DO-35 Package
D2	3C11804	Zener Diode 0.5W BZX79C18V DO-35 Package
D3	3B5403F	DIODE ULTRAFAST UF5403 DO-201AD Package
D4	3B5403F	DIODE ULTRAFAST UF5403 DO-201AD Package
D5	3B5403F	DIODE ULTRAFAST UF5403 DO-201AD Package
D6	3F5822	DIODE SCHOTTKY 1N5822 DO-201AD Package
D7	3F5822	DIODE SCHOTTKY 1N5822 DO-201AD Package
D8	3B5403F	DIODE ULTRAFAST UF5403 DO-201AD Package
D9	3B4004F	Diode Fast Recovery UF4004 DO-41 Package
D10	3B4004F	Diode Fast Recovery UF4004 DO-41 Package
D11	3A4148	Diode Small Signal 1N4148 DO-35 Package
D12	3C05604	Zener Diode 0.5W BZX79C5V6 DO-35 Package
D13	3C23905	Zener Diode 0.5W BZX79C39V DO-35 Package
D14	3B4004F	Diode Fast Recovery UF4004 DO-41 Package
D15	3A4148	Diode Small Signal 1N4148 DO-35 Package
D16	3A4148	Diode Small Signal 1N4148 DO-35 Package
D17	3A4148	Diode Small Signal 1N4148 DO-35 Package
D18	3A4148	Diode Small Signal 1N4148 DO-35 Package
D19	3C11504	Zener Diode 0.5W BZX79C15V DO-35 Package
D20	3C05604	Zener Diode 0.5W BZX79C5V6 DO-35 Package
D21	3A4148	Diode Small Signal 1N4148 DO-35 Package
D22	3F5711	DIODE SCHOTTKY 1N5711 DO-35 Package
F1	C12166	C12166 FUSE 20MM 1A6 T S5021.6A SPRING REDUNDANT
F1-1	8S004	FUSEHOLDER 20MM PCB
F1-2	F022	FUSEHOLDER COVER TO SUIT 8S004
HS1	F007	HEATSINK TO-220 23 degC/W CLIP ON
HS2	F007	HEATSINK TO-220 23 degC/W CLIP ON
HS3	E918MC	SHIELD EMC 40W RES PSU
HS3-1	HA3V06A	M SCREW TORX P/H M3x6MM ST ZP
HS3-2	HA3V10A	M SCREW TORX M3x10MM ST ZP
HS3-3	F216	HEATSINK CLIP DOUBLE TO-220 WARTH TSC607-ZP
HS3-4	E941MC	INSULATOR FOR 40W RES PSU 30MM X 40MM KOOL PAD
IC1	5D35804	IC Power Supply Controller UCC3580-4N DIP-16 Package
IC2	5THCNW137	Opto Isolator HCNW137
IC3	5D3843	IC Pulse Width Modulator UC3843AN DIP-8 Package
IC4	5T6283	OPTO ISOLATOR SFH628-A3
L1	L910TX	FLYBACK TRANSFORMER FOR 40W PSU
L2	7C033	Inductor 33UH 10%
L3	7C033	Inductor 33UH 10%
L4	7C033	Inductor 33UH 10%

L897 Power Supply Parts List Issue 4.1

Designator	Part	Description
L5	7C033	Inductor 33UH 10%
L6	7C033	Inductor 33UH 10%
L7	7C033	Inductor 33UH 10%
L8	7C033	Inductor 33UH 10%
L9	7E031	CHOKE MAINS COMMON MODE 7.7MH
M1	4K6N60E	Transistor Mosfet MTP6N60E TO-220 Package
M2	4K6N60E	Transistor Mosfet MTP6N60E TO-220 Package
M3	4K120	Transistor Mosfet ZVNL120A Eline Package
PB1	L897PB	BLANK PCB 40W RESONANT PSU PCB
PK1	E66901	MAINS SWITCH SPACER GASKET M01/0387
PL10	8K2904	CON VERT HEADER 4WAY
PL11	8K2904	CON VERT HEADER 4WAY
PL12	8K2904	CON VERT HEADER 4WAY
PL13	8K2904	CON VERT HEADER 4WAY
R1	1K515	Resistor Metal Glazed 0.25W 5% 1M5
R2	1C422	Resistor Carbon Film 2W 5% 220K
R3	1H847	Resistor Metal Film 0.25W 1% 4R7
R4	1H210	Resistor Metal Film 0.25W 1% 1K0
R5	1H422	Resistor Metal Film 0.25W 1% 220K
R6	1H422	Resistor Metal Film 0.25W 1% 220K
R7	1H422	Resistor Metal Film 0.25W 1% 220K
R8	1H422	Resistor Metal Film 0.25W 1% 220K
R9	1H333	Resistor Metal Film 0.25W 1% 33K
R10	1H422	Resistor Metal Film 0.25W 1% 220K
R11	1H410	Resistor Metal Film 0.25W 1% 100K
R12	1H422	Resistor Metal Film 0.25W 1% 220K
R13	1H410	Resistor Metal Film 0.25W 1% 100K
R14	1H347	Resistor Metal Film 0.25W 1% 47K
R15	1H333	Resistor Metal Film 0.25W 1% 33K
R16	1H422	Resistor Metal Film 0.25W 1% 220K
R17	1H022	Resistor Metal Film 0.25W 1% 22R
R18	1H010	Resistor Metal Film 0.25W 1% 10R
R19	1H010	Resistor Metal Film 0.25W 1% 10R
R20	1H310	Resistor Metal Film 0.25W 1% 10K
R21	1H310	Resistor Metal Film 0.25W 1% 10K
R22	1H310	Resistor Metal Film 0.25W 1% 10K
R23	1H410	Resistor Metal Film 0.25W 1% 100K
R24	1H310	Resistor Metal Film 0.25W 1% 10K
R25	1H315	Resistor Metal Film 0.25W 1% 15K
R26	1H310	Resistor Metal Film 0.25W 1% 10K
R27	1H310	Resistor Metal Film 0.25W 1% 10K
R28	1H422	Resistor Metal Film 0.25W 1% 220K
R29	1H310	Resistor Metal Film 0.25W 1% 10K
R30	1R922	Resistor Metal Film 0.25W 5% 0R22
R31	1H147	Resistor Metal Film 0.25W 1% 470R
R32	1H147	Resistor Metal Film 0.25W 1% 470R
R33	1H210	Resistor Metal Film 0.25W 1% 1K0
R34	1H210	Resistor Metal Film 0.25W 1% 1K0
R35	1H347	Resistor Metal Film 0.25W 1% 47K
R36	1H047	Resistor Metal Film 0.25W 1% 47R
R37	1H210	Resistor Metal Film 0.25W 1% 1K0
R38	1H210	Resistor Metal Film 0.25W 1% 1K0
R39	1H210	Resistor Metal Film 0.25W 1% 1K0
R40	1H210	Resistor Metal Film 0.25W 1% 1K0
R41	1H210	Resistor Metal Film 0.25W 1% 1K0
R42	1H210	Resistor Metal Film 0.25W 1% 1K0
R43	1H322	Resistor Metal Film 0.25W 1% 22K
R44	1H210	Resistor Metal Film 0.25W 1% 1K0
R45	1H210	Resistor Metal Film 0.25W 1% 1K0
R46	1H210	Resistor Metal Film 0.25W 1% 1K0
R47	1H147	Resistor Metal Film 0.25W 1% 470R
R48	1H147	Resistor Metal Film 0.25W 1% 470R

L897 Power Supply Parts List Issue 4.1

Designator	Part	Description
R49	1H222	Resistor Metal Film 0.25W 1% 2K2
R50	1H268	Resistor Metal Film 0.25W 1% 6K8
R51	1H310	Resistor Metal Film 0.25W 1% 10K
R52	1H316	Resistor Metal Film 0.25W 1% 16K
R53	1H847	Resistor Metal Film 0.25W 1% 4R7
R54	1H322	Resistor Metal Film 0.25W 1% 22K
R55	1H022	Resistor Metal Film 0.25W 1% 22R
R56	1H310	Resistor Metal Film 0.25W 1% 10K
R57	1H110	Resistor Metal Film 0.25W 1% 100R
R58	1H110	Resistor Metal Film 0.25W 1% 100R
R59	1H110	Resistor Metal Film 0.25W 1% 100R
R60	1H110	Resistor Metal Film 0.25W 1% 100R
R61	1H010	Resistor Metal Film 0.25W 1% 10R
R62	1H010	Resistor Metal Film 0.25W 1% 10R
R63	1H247	Resistor Metal Film 0.25W 1% 4K7
R64	1H147	Resistor Metal Film 0.25W 1% 470R
R65	1H147	Resistor Metal Film 0.25W 1% 470R
R66	1H315	Resistor Metal Film 0.25W 1% 15K
R67	1H315	Resistor Metal Film 0.25W 1% 15K
R68	1H310	Resistor Metal Film 0.25W 1% 10K
R69	1H347	Resistor Metal Film 0.25W 1% 47K
REG1	5D7818	IC VOLTAGE REGULATOR +18V L7818CV TO-220 PACKAGE
REG2	5D7918	IC VOLTAGE REGULATOR -18V L7918CV TO-220 PACKAGE
SK1	8K2306	CON MINIFIT HCS 6WAY
SK2	8K2406	CON CT SERIES VERTICAL 6WAY
SK3	8K2406	CON CT SERIES VERTICAL 6WAY
SK4	8K2408	CON CT SERIES VERTICAL 8WAY
SK5	8K2408	CON CT SERIES VERTICAL 8WAY
SK6	8K2408	CON CT SERIES VERTICAL 8WAY
SK7	8K2407	CON CT SERIES VERTICAL 7WAY
SK8	8K2404	CON CT SERIES VERTICAL 4WAY
SK10	8K2804	CON HORIZ PCB SKT 4WAY
SK11	8K2804	CON HORIZ PCB SKT 4WAY
SK12	8K2804	CON HORIZ PCB SKT 4WAY
SK13	8K2804	CON HORIZ PCB SKT 4WAY
SW1	A1007	SW PUSH MAINS
TH1	1T005	INRUSH CURRENT LIMITER 25R 3A NTC
TR1	4A546	Transistor BC546B TO92 Package
TR2	4A546	Transistor BC546B TO92 Package
TR3	4A546	Transistor BC546B TO92 Package
TR4	4A546	Transistor BC546B TO92 Package
TR5	4A546	Transistor BC546B TO92 Package
TR6	4A556	Transistor BC556B TO92 Package
TR7	4B677	Transistor Darlington BD677 TO-126 Package
TR8	4B677	Transistor Darlington BD677 TO-126 Package
TR9	4A556	Transistor BC556B TO92 Package
TR10	4A556	Transistor BC556B TO92 Package
TR11	4A546	Transistor BC546B TO92 Package
TR12	4A546	Transistor BC546B TO92 Package
TR13	4A546	Transistor BC546B TO92 Package
TX1	L909TX	GATE DRIVE TRANSFORMER FOR 40W PSU



DRAWING TITLE	40W Universal Power Supply	02_E142	KAL	15/07/02	R1 SET TO NF IC2 CHANGED TO HCNW137	4.0
2 3 4 2 5	Filename: L897CT_4.0.sch	02_E094	WAF	25/04/02	SCREW ON MOSFET LONGER	3.1
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB	Notes:	02_E090	WAF	16/04/02	PCB ONLY UPDATED FOR CHASSIS PLANES	3.0
		02_E051	KAL	18/02/02	ADDED R69 TO MAINS OK CCT C33 CHANGED TO NF	2.0
			WAF	13/11/01		1.0
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
	Contact Engineer: Kevin Lamb	Contact Tel: (01223) 203252	Printed: 23-Jul-2002		Sheet 1 of 1	DRAWING NO. L897CT

Display Board L898

Contents

- Circuit description
- Component overlay
- Parts list
- Circuit diagrams

AV8 Display Board

Refer to circuit diagram L898 sheet 1

Introduction

The AV8 display board contains the front panel graphical VFD display module, buttons, LEDs, remote IR receiver and encoder.

The graphical VFD display receives data directly from the micro on the digital board (via SK100).

Power Supply

The supply rails are supplied to the Display PCB Via SK100 from the digital board.
Please note that the supply rail marked P36VF1 has been reset to a voltage of +21volts, this is because the display was found to be to bright when supplied with +36volts.

LEDs

These are driven using two 74HCT595 (IC101 and IC102) output latches controlled via SK100 by the micro on the digital board.

- LED 100 is a bi-colour LED and is used for standby.
- LED 101 to LED 110 are function and source indicators.

Remote receiver

The remote receiver (RX101) output is buffered via a 74HC14D (IC104) this is then connected to the digital board via SK100 pin15.

Volume/encoder

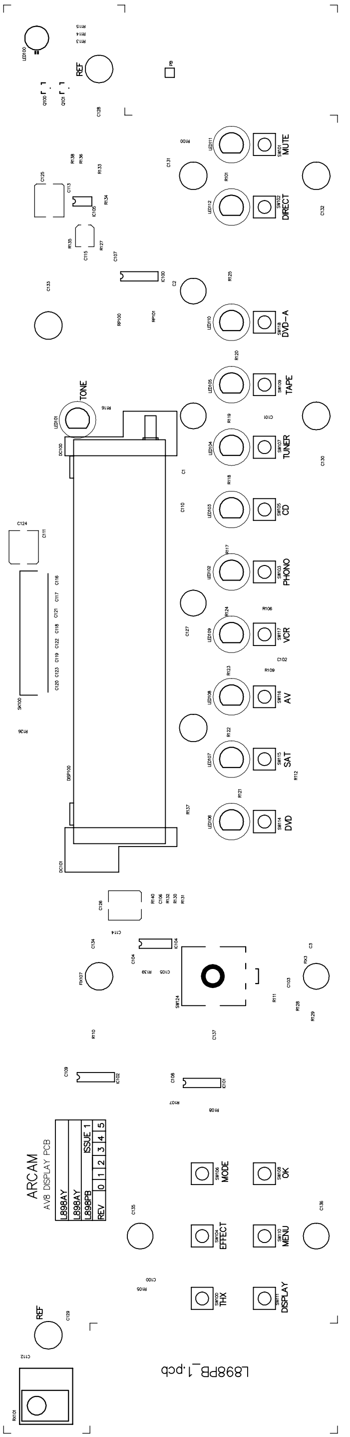
The encoder (SW124) output A and B is buffered via a 74HC14D (IC104) as PHASE A and PHASE B to the digital board via SK100 pins 12,13.

Keyboard

The keyboard is polled using a 74HCT595 (IC100), this is controlled by the micro on the digital board which scans the keyboard output.
Scanning sequence:

- The outputs of IC100 Q0 to Q7 are set low in sequence
- The keyboard lines KB0, KB1 and KB2 are read

When a key is pressed it will result in a low on KB0, KB1 or KB2.
The micro knows which output has been polled low (IC100 Q0 to Q7) and which line is low KB0, KB1 or KB2 and therefore the intersecting point will represent the key which has been pressed e.g. Q2 is polled low and KB1 is read as low means that the “CD” button has been pressed.



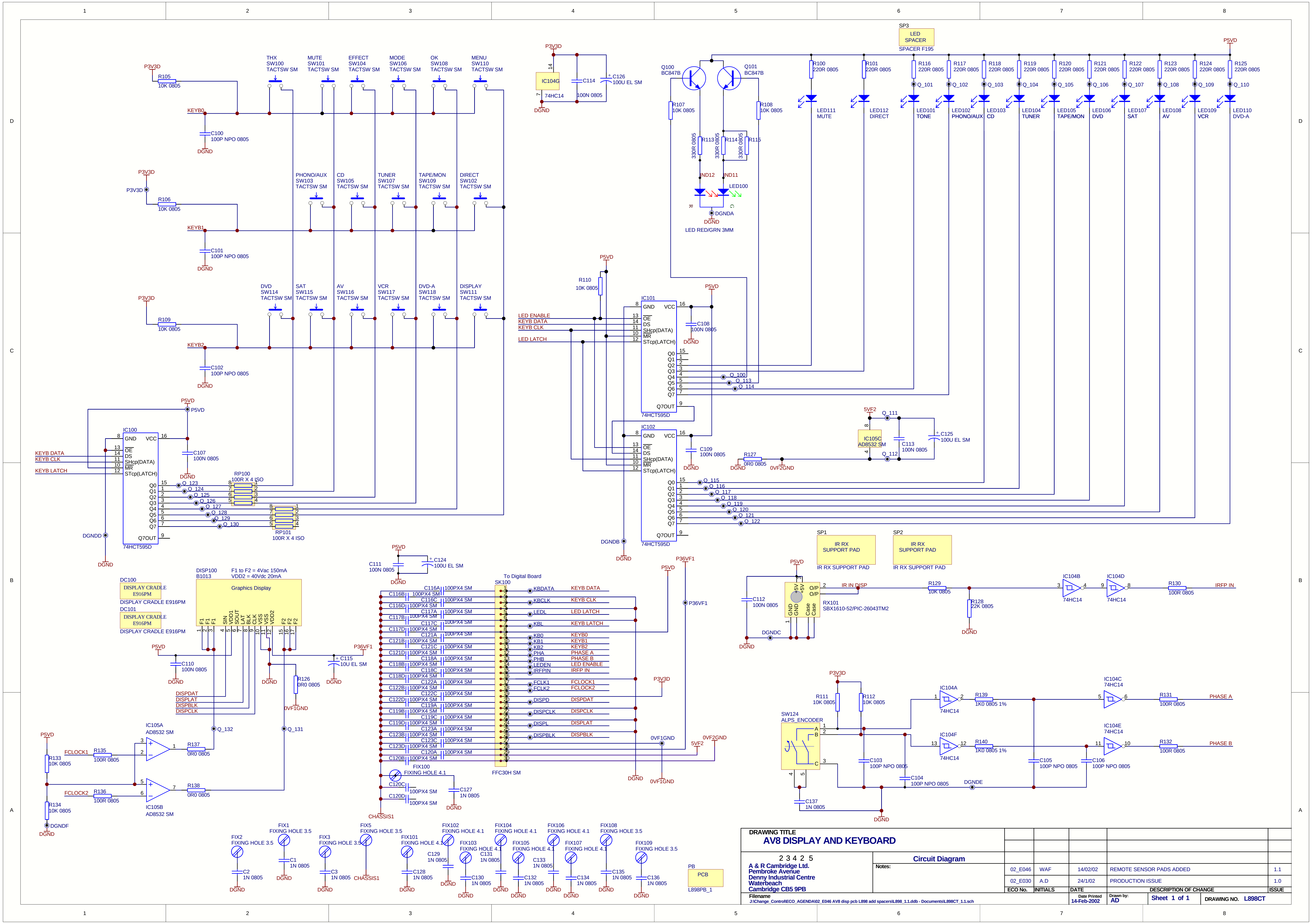
ARCAM
AV8 DISPLAY PCB
L898AY
L898AY
L898PB
ISSUE 1
REV 0 1 2 3 4 5
REF
TONE
MUTE
DIRECT
DVD-A
TAPE
TUNER
CD
PHONO
VCR
AV
SAT
DVD
MODE
OK
EFFECT
MENU
THX
DISPLAY
L898PB_1.pcb

L898 Display Board Parts List Issue 1.2

Designator	Part	Description
C1	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C2	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C3	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C100	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C101	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C102	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C103	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C104	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C105	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C106	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C107	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C108	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C109	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C110	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C111	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C112	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C113	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C114	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C115	2M610	Capacitor Surface Mount Electrolytic Dia 5mm 10UF 50V
C116	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C117	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C118	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C119	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C120	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C121	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C122	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C123	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C124	2M710	Capacitor Surface Mount Electrolytic Dia 8mm 100UF 25V
C125	2M710	Capacitor Surface Mount Electrolytic Dia 8mm 100UF 25V
C126	2M710	Capacitor Surface Mount Electrolytic Dia 8mm 100UF 25V
C127	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C128	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C129	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C130	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C131	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C132	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C133	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C134	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C135	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C136	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C137	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
DC100	E916PM	DISPLAY CRADLE B1013 (ITRON MN12818A)
DC101	E916PM	DISPLAY CRADLE B1013 (ITRON MN12818A)
DISP100	B1013	DISPLAY GRAPHICS 128X18
IC100	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC101	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC102	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC104	5K7414	IC HEX INVERTING SCHMITT TRIGGER 74HC14 SMT
IC105	5M8532	Opamp AD8532AR SM
LED100	3D006	LED 3mm Red/Green Tri-colour L-93WEGW
LED101	3D001	LED 5mm Green SLR-56MGT32
LED102	3D001	LED 5mm Green SLR-56MGT32
LED103	3D001	LED 5mm Green SLR-56MGT32
LED104	3D001	LED 5mm Green SLR-56MGT32
LED105	3D001	LED 5mm Green SLR-56MGT32
LED106	3D001	LED 5mm Green SLR-56MGT32
LED107	3D001	LED 5mm Green SLR-56MGT32
LED108	3D001	LED 5mm Green SLR-56MGT32
LED109	3D001	LED 5mm Green SLR-56MGT32
LED110	3D001	LED 5mm Green SLR-56MGT32
LED111	3D001	LED 5mm Green SLR-56MGT32
LED112	3D001	LED 5mm Green SLR-56MGT32
PB	L898PB	BLANK PCB AV8 DISPLAY PCB
Q100	4A847	Transistor BC847B SOT23 Package

L898 Display Board Parts List Issue 1.2

Designator	Part	Description
Q101	4A847	Transistor BC847B SOT23 Package
R100	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R101	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R105	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R106	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R107	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R108	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R109	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R110	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R111	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R112	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R113	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R114	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R115	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R116	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R117	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R118	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R119	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R120	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R121	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R122	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R123	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R124	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R125	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R126	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R127	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R128	1M333	Resistor 0805 Surface Mount 0.125W 1% 33K
R129	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R130	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R131	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R132	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R133	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R134	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R135	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R136	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R137	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R138	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R139	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R140	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
RP100	1V110B	Resistor Pack Surface Mount 4 Isolated Resistors 100R
RP101	1V110B	Resistor Pack Surface Mount 4 Isolated Resistors 100R
RX101	B2107	IR RECEIVER MODULE KODENSHI PIC-26043TM2
SK100	8K8430	CON 1.00MM HORIZ SM FFC 30WAY
SP1	E822AP	PAD ADHESIVE SPACING - DIVA REMOTE SENSOR
SP2	E822AP	PAD ADHESIVE SPACING - DIVA REMOTE SENSOR
SP3	F195	F195 SPACER 3.2MM OD5MM ID3MM
SW100	A1505	SWITCH TACT SM
SW101	A1505	SWITCH TACT SM
SW102	A1505	SWITCH TACT SM
SW103	A1505	SWITCH TACT SM
SW104	A1505	SWITCH TACT SM
SW105	A1505	SWITCH TACT SM
SW106	A1505	SWITCH TACT SM
SW107	A1505	SWITCH TACT SM
SW108	A1505	SWITCH TACT SM
SW109	A1505	SWITCH TACT SM
SW110	A1505	SWITCH TACT SM
SW111	A1505	SWITCH TACT SM
SW114	A1505	SWITCH TACT SM
SW115	A1505	SWITCH TACT SM
SW116	A1505	SWITCH TACT SM
SW117	A1505	SWITCH TACT SM
SW118	A1505	SWITCH TACT SM
SW124	A1211	ROT ENCODER VERT ALPS



DRAWING TITLE
AV8 DISPLAY AND KEYBOARD
Circuit Diagram
2 3 4 2 5
A & R Cambridge Ltd.
Pembroke Avenue
Denny Industrial Centre
Waterbeach
Cambridge CB5 9PB
Notes:
02_E046 WAF 14/02/02 REMOTE SENSOR PADS ADDED 1.1
02_E030 A.D 24/1/02 PRODUCTION ISSUE 1.0
ECO No. INITIALS DATE DESCRIPTION OF CHANGE ISSUE
Filename
J:\Change_Control\ECO_AGENDA\02_E046 AV8 disp pcb L898 add spacers\L898_1.1.ddb - Documents\L898CT_1.1.sch
Date Printed 14-Feb-2002
Drawn by: AD
Sheet 1 of 1
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THX SW100 TACTSW SM
MUTE SW101 TACTSW SM
EFFECT SW104 TACTSW SM
MODE SW106 TACTSW SM
OK SW108 TACTSW SM
MENU SW110 TACTSW SM
PHONO/AUX SW103 TACTSW SM
CD SW105 TACTSW SM
TUNER SW107 TACTSW SM
TAPE/MON SW109 TACTSW SM
DIRECT SW102 TACTSW SM
DVD SW114 TACTSW SM
SAT SW115 TACTSW SM
AV SW116 TACTSW SM
VCR SW117 TACTSW SM
DVD-A SW118 TACTSW SM
DISPLAY SW111 TACTSW SM
KEYB0
KEYB1
KEYB2
IC100 74HCT595D
IC101 74HCT595D
IC102 74HCT595D
IC104G 74HC14
Q100 BC847B
Q101 BC847B
LED RED/GRN 3MM
LED SPACER
SPACER F195
LED111 MUTE
LED112 DIRECT
LED101 TONE
LED102 PHONO/AUX
LED103 CD
LED104 TUNER
LED105 TAPE/MON
LED106 DVD
LED107 SAT
LED108 AV
LED109 VCR
LED110 DVD-A
DISP100 B1013
Graphics Display
F1 to F2 = 4Vac 150mA
VDD2 = 40Vdc 20mA
DC100 DISPLAY CRADLE E916PM
DC101 DISPLAY CRADLE E916PM
To Digital Board
SK100
FFC30H SM
IR RX SUPPORT PAD
RX101 SBX1610-52/PIC-26043TM2
IC105A AD8532 SM
IC105B AD8532 SM
IC105C AD8532 SM
SW124 ALPS_ENCODER
PHASE A
PHASE B
IRFP IN
FCLOCK1
FCLOCK2
CHASSIS1
PCB L898PB_1

Audio Board L921

Contents

- Circuit description
- Component overlay
- Parts list
- Circuit diagrams

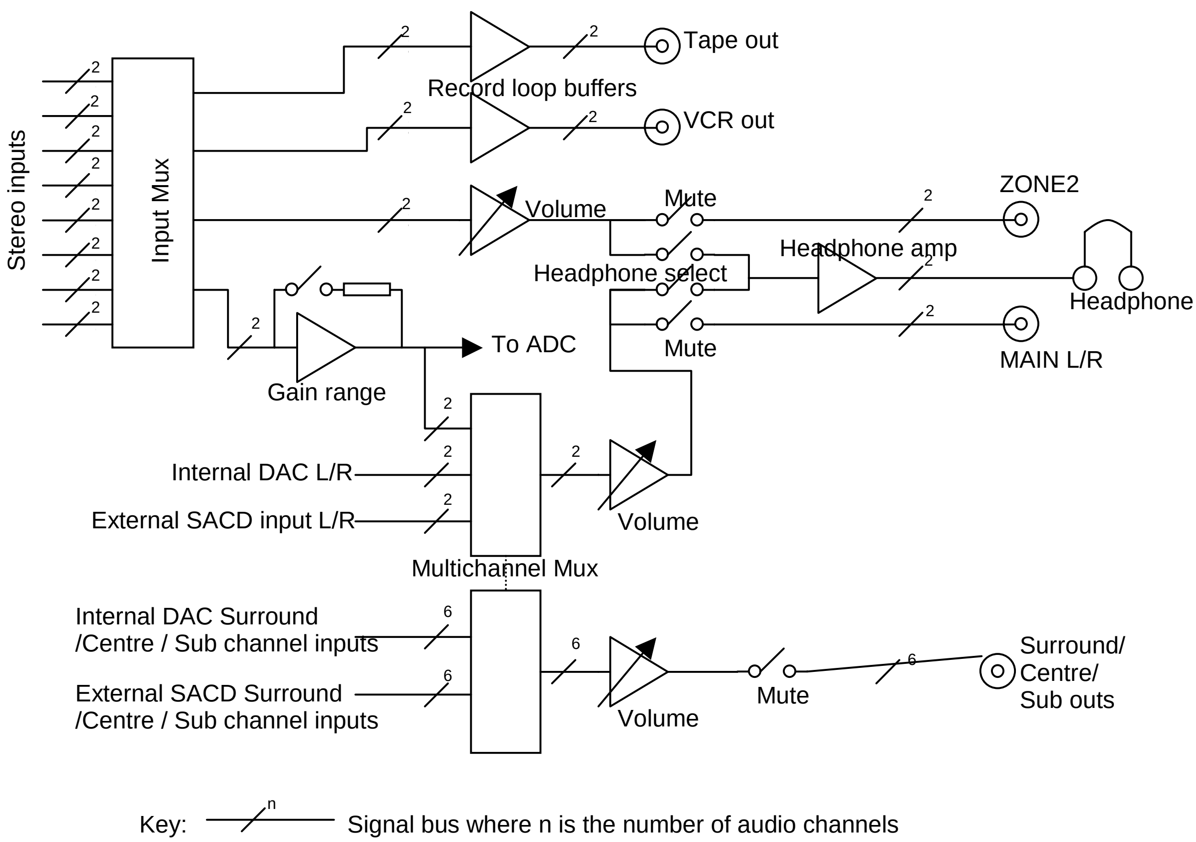
AV8 Audio Board

Introduction

This board forms part of the AV8 Preamp Processor, it performs analogue input selection and routing of analogue signals to the various outputs. There are four sets of outputs; main, zone2 and two tape loops “Tape” and ”VCR”. Main and zone2 outputs have volume controls (either of which can be the source for the on-board headphone amplifier). A gain ranging stage in the middle of the audio path sets the headroom of the signal chain and also provides a feed to the A-D converter on the digital board.

Control of the board is via the host micro-controller on the digital board.

BLOCK DIAGRAM



Input switching
Refer to circuit diagram L921 sheet 1

The 24 off 74HCT4053 analogue multiplexers route the various analogue inputs to the four output mix buses:-

- VCR
- Tape
- Analogue
- Zone2

The main stereo inputs have 100pF NP0 capacitors to ground to reduce any high frequency signals radiating from the input cables which are connected to the unit. This is an EMC preventative measure.

In addition to be able to select any particular input as the source, the input impedance of each input connector was required to remain constant regardless of whether it was selected or not. Input selection is therefore performed using a method called "virtual earth mixing". Each input can be switched to one of the four stereo busses via an input resistor, or switched to ground

For simplicity consider only the main ANALOGUE L MIX bus. Each input is fed onto the common bus via a resistor and an electronic switch. The bus is the input to an op-amp in an inverting configuration. The switch either allows the signal through to the op-amp, or shunts it to ground. The inverting input of an inverting configured op-amp effectively behaves as a ground (hence "virtual earth"), which is why the input impedance looks the same regardless of the state of the switch.

In theory all inputs can mix into the op-amp simultaneously, but the control software only allows one input switch to connect to the op-amp at a time. If multiple inputs can be heard simultaneously then there may be a problem with the control logic (see L921 circuit sheet 7), or the AUD SDATA line from the Digital board may be latched high.

For the "ANALOGUE L MIX" and "ANALOGUE R MIX" buses, the resistor is 15kΩ, for the other three buses, the value is 100kΩ. The three 100kΩ in parallel with 15kΩ give a total input impedance of just over 10kΩ - the minimum required for THX certification. These particular values were chosen to maximise the noise performance of the main stereo ANALOGUE L/R MIX buses, bearing in mind that a larger value resistor has poorer noise performance. The 100kΩ resistors feed into the op-amps of the less critical audio paths for ZONE2 and the record loops VCR MIX and TAPE MIX.

Input gain range
Refer to circuit diagram L921 sheet 3

The gain ranger sets the headroom for the A-D converter (on the digital board) and for the rest of the analogue chain. The aim is to set the gain such that clip is not quite reached with the input of the unit receiving a maximum signal. Excessive headroom reduces signal-to-noise performance unnecessarily. Left and right channels are identical, therefore only the left channel will be described.

IC301A is the op-amp into which the input resistors feed (described in *Input switching* above). R302 in the fixed feedback path ensures the op-amp cannot go open loop, causing it to latch into a power rail. C301 compensates for small stray capacitances at the op-amp input, ensuring it does not oscillate. Switching in R303, R304, R305 or any combination in parallel with R302 sets the closed loop gain with reference to the 15kΩ input resistor. IC302 selects which of the three resistors are in circuit. It is controlled by the micro via control line demultiplexer IC707. Several ranges, nominally +6dB, 0dB, -6dB and -12dB can be generated depending on the state of the 'GAIN RANGE' lines A,B & C as shown below.

Gain Range	+6dB	0dB	-6dB	-12dB
A	LOW	HI	HI	HI
B	LOW	LOW	HI	HI
C	LOW	LOW	LOW	HI

IC301A output feeds into an inverting unity gain buffer (IC301B) which is referenced to 0V_SIG. R315 links 0V_SIG to the ADC circuits on the digital board via connector SK915.

External / internal multichannel & main stereo input multiplexer
Refer to circuit diagram L921 sheet 2

This group of multiplexers selects the signals to be routed to the output volume controls.
The three signal sources are:-

- FROM MAIN GR(L/R)
  stereo from the gain ranger
- FROM INT MAIN(L/R)
  multichannel from the digital-analogue converters on the digital board
- FROM EXT MAIN(L/R)
  external analogue multichannel source

These are selected by one of three control lines from the micro via control line demultiplexer IC707.

- ANALOGUE TO MAIN
- INT DECODER
- EXT DECODER

The multiplexers (except for IC204) select the feed-forward resistor in a unity gain inverting amplifier. Left and right sub-circuits are identical, therefore only left (IC201, IC203A) will be described.

When ANALOGUE TO MAIN is high, the signal from the gain ranger is selected via R201. The feedback around op-amp IC203A is more complex than a standard inverting configuration. Capacitor C203 removes any dc content to subsequent circuits. However, since capacitors have non-linear characteristics which are undesirable and adversely affect the sound, C203 is placed in the feedback path in series with the feedback resistor R205 to compensate for these errors. R204 is in parallel with C203 and R205 to provide a local dc feedback path. Without this the op-amp would be open-loop at dc and would therefore latch into the power rail. C202 compensates for stray capacitance at the input of the op-amp and rolls off very high frequency gain to provide stability.

It is normal to see a few volts of dc offset at the output pin of the op-amp. This is because of the high dc gain of the circuit (1M / 15k ≈ 67 or +36.5dB). This dc offset could be due to the *input offset voltage* of the op-amps themselves (up to ±2mV for OPA2134, producing a dc offset at the output of 134mV) or because of a dc offset supplied by the signal source connected to the unit. In the normal operating mode where the gain ranger is at unity, the absolute maximum permitted dc offset at the input to the unit is approximately 150mV. This would produce a dc offset at the output pin of the op-amp of about 10.2V. This would still leave sufficient headroom for a 2Vrms audio signal on top of this offset.

The surround and sub channels (IC205/206/208/209) are very similar to the left channel described above except for the op-amp ground references being tied directly to 0V_SIG. External multichannel inputs (FROM EXT MAIN L, FROM EXT SURR L, etc) have 100pF NP0 capacitors to ground as an EMC preventative measure.

Volume control and headphones
Refer to circuit diagram L921 sheet 5,6

Volume control is performed by a Burr-Brown PGA2310 volume control chip. This chip is pin and software compatible with the Crystal Semiconductor CS3310 volume control chip. The only difference is that the internal op-amps run off ±15 volts rather than ±5 volts. The gain is under micro control with steps of 0.5dB. All volume controls share data, clock and mute control lines but have individual chip select lines. The volume of each channel can be controlled individually. "Zero-crossing" detect is permanently enabled on each volume chip to give click-free volume changes. If, however, clicking can be heard when changing volume, especially at higher levels, it is likely that there is a dc offset into the volume control chip. This points to an error in the previous stage which should have removed all dc. The DCA XMUTE line is a power-on mute with a time constant set by R703 and C701 (sheet7). The output op-amps (IC 502, 505 etc) are configured to block dc and are inverting amplifiers to restore the polarity of the signal as the volume control chips are non-inverting.

Since all outputs are identical only the main left output around IC502A will be described. IC501 is a self contained volume control with non-inverting op-amp. C501 prevents oscillation of IC502A. C507 blocks dc to subsequent stages of the circuit but is in the feedback path. This provides some compensation for capacitor non-linearities. R527 provides a local dc path to prevent the op-amp latching into rail. R502 provides output protection, limiting current in the event of the output being shorted. R503 provides a weak 0V reference to prevent the output floating. IC503 is a DG413 analogue switch which acts as a mute under micro control via demultiplexer IC708. The five DG413s play a vital role in preventing thumps at turn on/off.

At power on, the MAIN OUTS ENABLE and ZONE 2 OUTS ENABLE lines are forced low in hardware, pulling the output connectors to ground. The hardware control of these lines is determined by an RC time constant (see '**control lines from micro'** below for details). This allows sufficient time for the micro to boot up and take control of these lines.

At power off, the micro detects power loss and forces the outputs into the mute (grounded) state. This prevents any pops. However, if the DG413s were run directly off the +/- 15V rails, the outputs were found to drift to a dc level that tripped power amplifiers into dc protect. This was due to the way the power rails collapsed. (The -15V rail actually went slightly positive for a time causing the dc output drift.) D506 and D507 isolate the output mutes from the main +/-15V supply. C543 keeps the supplies to the output mutes up until long after the main +/-15V rails have completely collapsed. R537 and R538 are actually capacitors to decouple both local supplies to ground.

D503 protects the output stage by shunting over-voltage spikes to the power rails. (It should be noted that the diodes are not power devices, therefore they are likely to fail if a high energy pulse is fired up the outputs of the unit.) C502 shunts any high frequency signals at the output to ground to help EMC.

The source for the headphone can be from the MAIN output (IC502) or ZONE2 (IC505). Selection is by 74HCT4053 multiplexers IC507 and IC508 under micro control via control line demultiplexer IC708. IC509 is an LM4880 headphone driver IC which runs off the +5V (analogue) rail. Its supply is drawn through a 2.2ohm resistor to try to provide some crosstalk isolation to the input multiplexers +5V power rail.

Zone2 and record loop outputs
Refer to circuit diagram L921 sheet 4

The input switches on schematic page 1 mix onto a virtual earth bus (ZONE2, TAPE OUT or VCR OUT). The associated op-amps are found here. Zone2 (IC401) has the same type of dc blocking circuit as described before for sheet 2 of the schematics. Note however that the feed forward resistor is 100kΩ. To maintain unity gain, the feedback resistors R402 and R404 have been chosen such that their value in parallel with 1MΩ equates to 100kΩ.

TAPE and VCR record outputs (IC402 and IC403) have 100kΩ as the feedback resistor in series with a 47Ω output protection resistor. The outputs are capacitively coupled without compensation with a weak 100kΩ pull-down to 0V_SIG to prevent the outputs floating off.

Control lines from the micro
Refer to circuit diagram L921 sheet 7

Control lines for individual switches etc are derived from 16-bit words sent as serial data to three sets of serial to parallel latches (port expanders). In this way, many local control lines can be provided whilst only using a few micro I/O ports. The same data and clock lines also drive the PGA2310 volume control chip. IC702 decodes chip selects for the volume control and latch devices. On power up, the contents of the latches is cleared using a buffered R-C circuit (R703, C701, IC701E/F). This also mutes the volume control chips. In practice however, this latch clear and volume mute line is of limited use as the +5V analogue supply collapses slowly. If the unit is switched off and back on within a period of 5 seconds, C701 will not have discharged via D701 sufficiently for the input of Schmitt trigger IC701E to interpret a LOW condition. The default power-on state for the volume control chips mute in any case.

IC708 is a special case as it provides the control of the MAIN and ZONE 2 OUTS ENABLE. These <u>must</u> be low at power up to prevent turn-on thumps, due to the initialisation time period of the micro this must be done in hardware. C710 and R729 generate a line that is HIGH at switch-on, which sets the output of the latch to tristate (high impedance). R535 and R536 pull these lines low so that the output mute ICs switch the outputs to ground, theoretically keeping the outputs silent during power-up. In practice a small tick may be heard because the logic devices don't begin to operate properly until they have a few volts across them. C710 charges via R729 over a period of approximately one second. The falling OE line to IC708 enables the latch outputs, which have by now been written to by the uC.

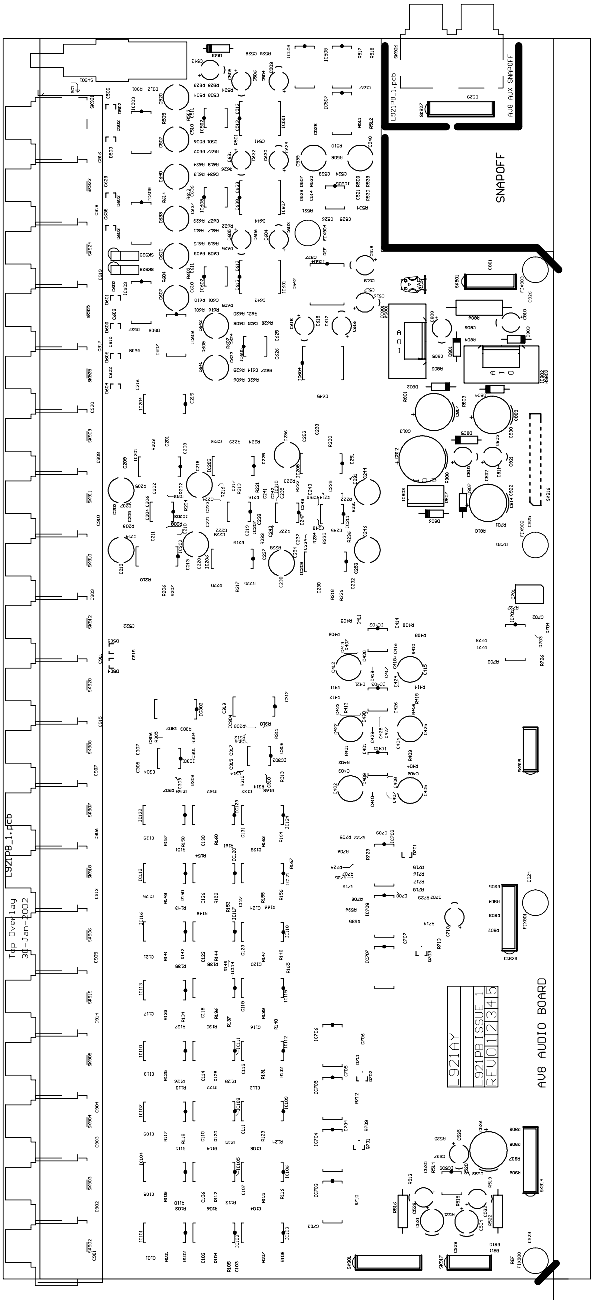
Power supply
Refer to circuit diagram L921 sheet 8

The board is powered from the +/-18V and +21V supplies which are regulated using standard LM317T and

LM337Ts. IC801 is a voltage regulator and is set for +15V. IC802 gives -15V and its output is also used to derive -5.1V using a Zener diode. IC803 gives a +5V supply. R806 is used to reduce the voltage drop across IC803 and therefore reduce heat dissipation in the part.

General Overlay / Interconnections
Refer to circuit diagram L921 sheet 9

Switch SW901 allows a "ground lift" facility. 0V_SIG is either isolated from the chassis or tied by R901 and C912 in parallel. Header SK917 connects to the headphone jack board. R910 and R911 provide a switched 3.3V control signal from a 5V supply back to the micro to indicate when headphones are connected.


AV8 AUDIO BOARD
L921AY
L921PB ISSUE 1
REV 0 1 2 3 4 5
Top Overlay
30-Jan-2002
L921PB_1.pcb
SNAPOFF
AV8 AUX SNAPOFF

L921 Audio Board Parts List Issue 1.2

Designator	Part	Description
C101	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C102	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C103	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C104	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C105	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C106	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C107	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C108	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C109	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C110	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C111	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C112	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C113	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C114	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C115	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C116	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C117	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C118	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C119	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C120	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C121	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C122	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C123	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C124	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C125	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C126	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C127	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C128	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C129	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C130	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C131	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C132	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C201	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C202	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C203	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C204	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C205	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C206	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C207	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C208	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C209	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C210	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C211	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C212	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C213	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C214	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C215	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C216	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C217	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C218	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C219	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C220	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C221	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C222	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C223	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C224	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C225	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C226	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C227	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C228	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C229	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C230	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P

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Designator	Part	Description
C231	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C232	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C233	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C234	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C235	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C236	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C237	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C238	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C239	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C240	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C241	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C242	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C243	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C244	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C245	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C246	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C247	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C248	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C249	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C250	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C251	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C252	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C253	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C254	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C301	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C303	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C304	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C305	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C306	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C307	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C308	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C310	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C312	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C313	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C314	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C315	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C316	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C317	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C401	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C402	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C403	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C404	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C405	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C406	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C407	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C408	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C409	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C410	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C411	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C412	2U610	Capacitor Non-Polar Radial Electrolytic 10UF 63V
C413	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C414	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C415	2U610	Capacitor Non-Polar Radial Electrolytic 10UF 63V
C416	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C417	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C418	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C419	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C420	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C421	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C422	2U610	Capacitor Non-Polar Radial Electrolytic 10UF 63V
C423	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C424	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P

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Designator	Part	Description
C425	2U610	Capacitor Non-Polar Radial Electrolytic 10UF 63V
C426	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C427	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C428	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C429	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C430	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C501	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C502	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C503	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C504	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C505	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C506	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C507	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C508	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C509	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C510	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C511	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C512	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C513	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C514	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C515	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C516	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C517	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C518	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C519	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C520	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C521	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C522	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C523	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C524	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C525	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C526	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C527	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C528	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C529	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C530	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C531	2N722	Capacitor Radial Electrolytic Dia 6.3mm Pitch 5mm 220UF 16V
C532	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C533	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C534	2N722	Capacitor Radial Electrolytic Dia 6.3mm Pitch 5mm 220UF 16V
C535	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C536	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C537	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C538	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C539	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C540	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C541	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C542	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C543	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C601	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C602	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C603	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C604	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C605	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C606	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C607	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C608	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C609	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C610	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C611	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C612	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C613	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N

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Designator	Part	Description
C614	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C615	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C616	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C617	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C618	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C619	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C620	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C621	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C622	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C623	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C624	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C625	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C626	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C627	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C628	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C629	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C630	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C631	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C632	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C633	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C634	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C635	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C636	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C637	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C638	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C639	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C640	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C641	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C642	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C643	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C644	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C645	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C701	2K447	Capacitor Boxed Polyester 5mm Pitch 10% 63V 470N
C702	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C703	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C704	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C705	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C706	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C707	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C708	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C709	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C710	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C801	2W210X4	Capacitor Network SM 0612 NP0 Ceramic 1000P X 4 50V
C802	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C805	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C806	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C807	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C808	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C809	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C810	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C811	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C812	2Z810C	Capacitor Low Impedance Radial Electrolytic Dia 12.5mm Pitch 5mm 1000UF 35V
C813	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C814	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C815	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C900	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C901	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C902	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C903	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C904	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C905	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C906	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N

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Designator	Part	Description
C907	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C908	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C909	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C910	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C911	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C912	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C913	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C914	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C915	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C916	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C917	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C918	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C919	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C920	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C921	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C922	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C923	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C924	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C925	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C926	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C927	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C928	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C929	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
D501	3C05104	Zener Diode 0.5W BZX79C5V1 DO-35 Package
D502	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D503	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D504	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D505	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D506	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D507	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D600	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D601	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D602	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D603	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D604	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D605	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D701	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D702	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D801	3B4003	Diode 1N4003 DO-41 Package
D802	3B4003	Diode 1N4003 DO-41 Package
D803	3B4003	Diode 1N4003 DO-41 Package
D804	3B4003	Diode 1N4003 DO-41 Package
D805	3C05104	Zener Diode 0.5W BZX79C5V1 DO-35 Package
D806	3B4003	Diode 1N4003 DO-41 Package
D807	3B4003	Diode 1N4003 DO-41 Package
HS801	F007	HEATSINK TO-220 23 degC/W CLIP ON
HS802	F007	HEATSINK TO-220 23 degC/W CLIP ON
IC101	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC102	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC103	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC104	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC105	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC106	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC107	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC108	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC109	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC110	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC111	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC112	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC113	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC114	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC115	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16

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Designator	Part	Description
IC116	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC117	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC118	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC119	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC120	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC121	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC122	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC123	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC124	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC201	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC202	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC203	5B2134	Opamp OPA2134UA SO-8 Package
IC204	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC205	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC206	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC207	5B2134	Opamp OPA2134UA SO-8 Package
IC208	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC209	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC210	5B2134	Opamp OPA2134UA SO-8 Package
IC211	5B2134	Opamp OPA2134UA SO-8 Package
IC301	5B2134	Opamp OPA2134UA SO-8 Package
IC302	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC303	5B2134	Opamp OPA2134UA SO-8 Package
IC304	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC401	5B2134	Opamp OPA2134UA SO-8 Package
IC402	5B072D	Opamp TL072CD SO-8 Package
IC403	5B072D	Opamp TL072CD SO-8 Package
IC501	5A2310	IC AUDIO DIGITAL STEREO VOLUME CTRL
IC502	5B2134	Opamp OPA2134UA SO-8 Package
IC503	5S413DY	IC QUAD ANALOGUE SWITCH DG413DY SO-16 PACKAGE
IC504	5A2310	IC AUDIO DIGITAL STEREO VOLUME CTRL
IC505	5B2134	Opamp OPA2134UA SO-8 Package
IC506	5S413DY	IC QUAD ANALOGUE SWITCH DG413DY SO-16 PACKAGE
IC507	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC508	5K4053HCT	IC Triple 2 Channel Analogue Mux 74HCT4053 SO-16
IC509	5A4880	IC HeadPhone Amp Nat Semi LM4880M SO-8 Package
IC601	5A2310	IC AUDIO DIGITAL STEREO VOLUME CTRL
IC602	5B2134	Opamp OPA2134UA SO-8 Package
IC603	5S413DY	IC QUAD ANALOGUE SWITCH DG413DY SO-16 PACKAGE
IC604	5A2310	IC AUDIO DIGITAL STEREO VOLUME CTRL
IC605	5B2134	Opamp OPA2134UA SO-8 Package
IC606	5S413DY	IC QUAD ANALOGUE SWITCH DG413DY SO-16 PACKAGE
IC607	5A2310	IC AUDIO DIGITAL STEREO VOLUME CTRL
IC608	5B2134	Opamp OPA2134UA SO-8 Package
IC609	5S413DY	IC QUAD ANALOGUE SWITCH DG413DY SO-16 PACKAGE
IC701	5J7414D	DO NOT USE THIS PART! USE 5K7414
IC702	5K74138	IC 3 TO 8 LINE DECODER 74HC138D SMT
IC703	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC704	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC705	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC706	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC707	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC708	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC801	5D317T	IC VOLTAGE REGULATOR ADJ LM317T TO-220 PACKAGE
IC802	5D337	IC VOLTAGE REGULATOR NEG ADJ LM337T TO-220 PACKAGE
IC803	5D317T	IC VOLTAGE REGULATOR ADJ LM317T TO-220 PACKAGE
JP900	8K004	CON JUMPER SOCKET 0.1IN GOLD BLUE
JP901	8K004	CON JUMPER SOCKET 0.1IN GOLD BLUE
PCB1	L921PB	BLANK PCB AV8 AUDIO BOARD
Q701	4A856B	Transistor BC856B SOT23 Package
Q702	4A856B	Transistor BC856B SOT23 Package
Q703	4A856B	Transistor BC856B SOT23 Package

L921 Audio Board Parts List Issue 1.2

Designator	Part	Description
R101	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R102	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R103	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R104	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R105	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R106	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R107	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R108	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R109	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R110	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R111	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R112	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R113	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R114	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R115	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R116	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R117	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R118	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R119	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R120	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R121	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R122	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R123	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R124	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R125	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R126	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R127	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R128	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R129	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R130	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R131	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R132	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R133	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R134	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R135	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R136	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R137	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R138	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R139	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R140	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R141	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R142	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R143	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R144	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R145	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R146	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R147	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R148	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R149	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R150	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R151	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R152	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R153	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R154	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R155	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R156	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R157	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R158	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R159	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R160	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R161	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R162	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K

L921 Audio Board Parts List Issue 1.2

Designator	Part	Description
R163	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R164	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R165	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R166	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R167	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R168	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R201	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R202	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R203	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R204	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R205	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R206	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R207	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R208	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R209	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R210	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R213	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R214	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R215	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R216	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R217	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R218	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R219	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R220	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R221	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R222	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R223	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R224	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R225	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R226	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R227	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R228	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R229	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R230	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R231	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R232	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R233	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R234	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R235	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R236	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R302	1M330	Resistor 0805 Surface Mount 0.125W 1% 30K
R303	1M330	Resistor 0805 Surface Mount 0.125W 1% 30K
R304	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R305	1M243	Resistor 0805 Surface Mount 0.125W 1% 4K3
R306	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R307	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R309	1M330	Resistor 0805 Surface Mount 0.125W 1% 30K
R310	1M330	Resistor 0805 Surface Mount 0.125W 1% 30K
R311	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R312	1M243	Resistor 0805 Surface Mount 0.125W 1% 4K3
R313	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R314	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R315	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R401	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R402	1M411	Resistor 0805 Surface Mount 0.125W 1% 110K
R403	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R404	1M411	Resistor 0805 Surface Mount 0.125W 1% 110K
R405	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R406	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R407	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R408	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R409	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K

L921 Audio Board Parts List Issue 1.2

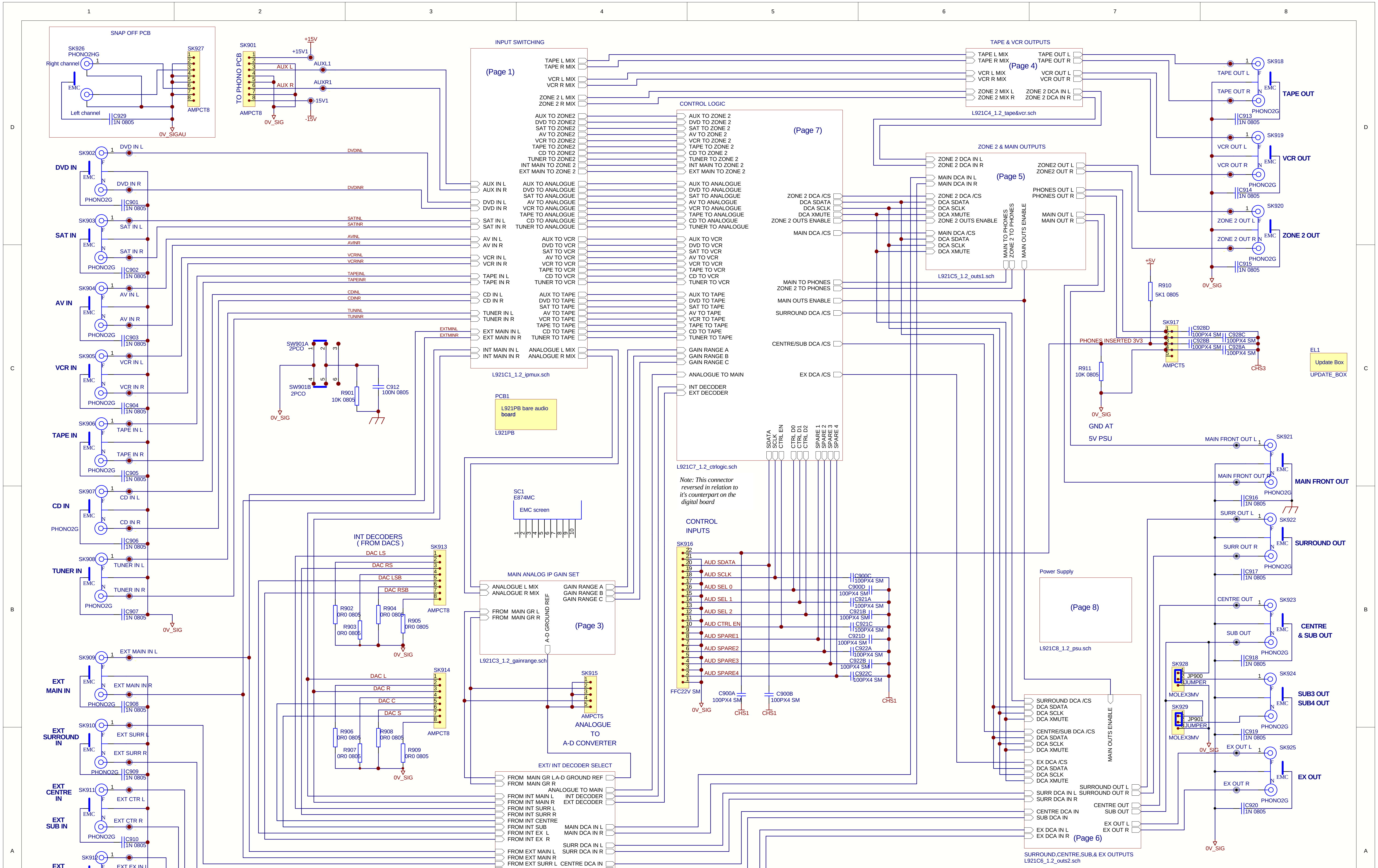
Designator	Part	Description
R410	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R411	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R412	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R413	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R414	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R415	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R416	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R501	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R502	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R503	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R504	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R505	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R506	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R507	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R508	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R509	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R510	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R511	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R512	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R513	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R514	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R515	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R516	1D847	Resistor Carbon Film 0W5 5% 4R7
R517	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R518	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R519	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R520	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R521	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R522	1D847	Resistor Carbon Film 0W5 5% 4R7
R523	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R524	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R525	1M822	Resistor 0805 Surface Mount 0.125W 1% 2R2
R526	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R527	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R528	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R529	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R530	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R531	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R532	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R533	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R534	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R535	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R536	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R537	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
R538	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
R601	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R602	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R603	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R604	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R605	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R606	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R607	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R608	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R609	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R610	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R611	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R612	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R613	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R614	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R615	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R616	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R617	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0

L921 Audio Board Parts List Issue 1.2

Designator	Part	Description
R618	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R619	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R620	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R621	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R622	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R623	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R624	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R625	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R626	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R627	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R628	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R629	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R630	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R701	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R702	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R703	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R704	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R705	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R706	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R707	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R708	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R709	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R710	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R711	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R712	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R713	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R714	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R715	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R716	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R717	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R718	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R719	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R720	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R721	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R722	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R723	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R724	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R725	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R726	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R727	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R728	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R729	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R801	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R802	1M224	Resistor 0805 Surface Mount 0.125W 1% 2K4
R803	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R804	1M224	Resistor 0805 Surface Mount 0.125W 1% 2K4
R805	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R806	1C122	Resistor Carbon Film 2W 5% 220R
R807	1M139	Resistor 0805 Surface Mount 0.125W 1% 390R
R808	1M212	Resistor 0805 Surface Mount 0.125W 1% 1K2
R810	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R901	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R902	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R903	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R904	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R905	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R906	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R907	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R908	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R909	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R910	1M251	Resistor 0805 Surface Mount 0.125W 1% 5K1
R911	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K

L921 Audio Board Parts List Issue 1.2

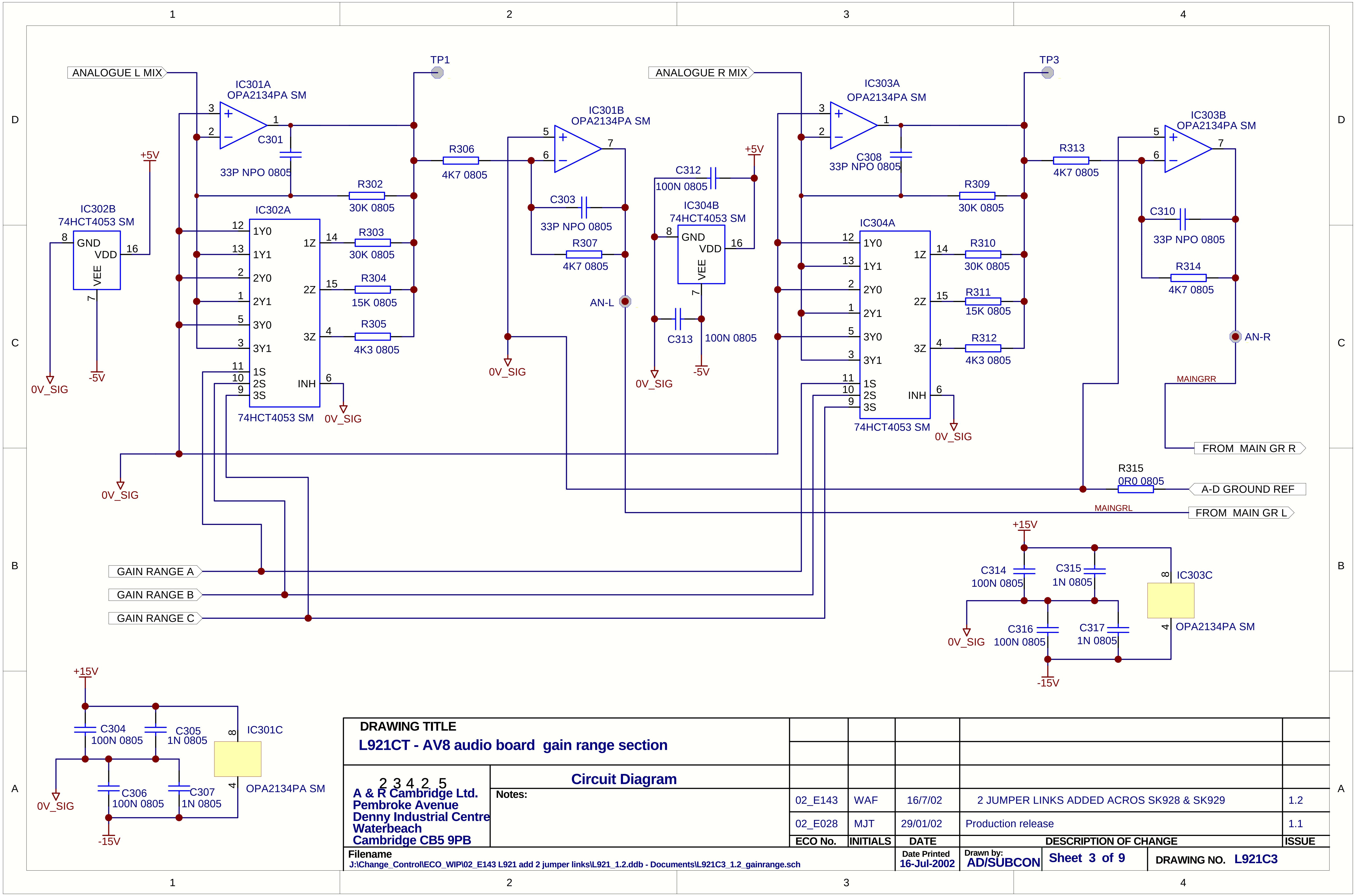
Designator	Part	Description
SC1	E874MC	SHIELD EMC AUDIO PCB FMJ AV8
SK801	8K2406	CON CT SERIES VERTICAL 6WAY
SK901	8K2408	CON CT SERIES VERTICAL 8WAY
SK902	8D226	Phono socket 2 way vertical gold
SK903	8D226	Phono socket 2 way vertical gold
SK904	8D226	Phono socket 2 way vertical gold
SK905	8D226	Phono socket 2 way vertical gold
SK906	8D226	Phono socket 2 way vertical gold
SK907	8D226	Phono socket 2 way vertical gold
SK908	8D226	Phono socket 2 way vertical gold
SK909	8D226	Phono socket 2 way vertical gold
SK910	8D226	Phono socket 2 way vertical gold
SK911	8D226	Phono socket 2 way vertical gold
SK912	8D226	Phono socket 2 way vertical gold
SK913	8K2408	CON CT SERIES VERTICAL 8WAY
SK914	8K2408	CON CT SERIES VERTICAL 8WAY
SK915	8K2005	CON CT SERIES VERTICAL 5WAY
SK916	8K8322	CON 1.00MM VERTICAL SM FFC 22WAY
SK917	8K2005	CON CT SERIES VERTICAL 5WAY
SK918	8D226	Phono socket 2 way vertical gold
SK919	8D226	Phono socket 2 way vertical gold
SK920	8D226	Phono socket 2 way vertical gold
SK921	8D226	Phono socket 2 way vertical gold
SK922	8D226	Phono socket 2 way vertical gold
SK923	8D226	Phono socket 2 way vertical gold
SK924	8D226	Phono socket 2 way vertical gold
SK925	8D226	Phono socket 2 way vertical gold
SK926	8D230	PHONO SKT 2-WAY HORIZ GOLD
SK927	8K2408	CON CT SERIES VERTICAL 8WAY
SK928	8K2103	CON SINGLE ROW HDR 0.1IN VERTICAL 3WAY
SK929	8K2103	CON SINGLE ROW HDR 0.1IN VERTICAL 3WAY
SW901	A1008	SW PUSH 2PCO ALPS



DRAWING TITLE					
L921CT - AV8 audio board interconnections					
2 3 4 2 5	Circuit Diagram				
A & R Cambridge Ltd. Pembroke Avenue Denny Industrial Centre Waterbeach Cambridge CB5 9PB	Notes:	02_E143	WAF	16/7/02	2 JUMPER LINKS ADDED ACROS SK928 & SK929	1.2
		02_E028	MJT	29/01/02	Production release	1.1
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE

Filename J:\Change_Control\ECO_WIP\02_E143 L921 add 2 jumper links\L921_1.2.ddb - Documents\L921C9_1.2.PRJ

Date Printed 16-Jul-2002 | Drawn by: AD/subcon | Sheet 9 of 9 | DRAWING NO. L921C9



DRAWING TITLE

L921CT - AV8 audio board gain range section

Circuit Diagram

2 3 4 2 5

A & R Cambridge Ltd.
Pembroke Avenue
Denny Industrial Centre
Waterbeach
Cambridge CB5 9PB

Notes:

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02_E143	WAF	16/7/02	2 JUMPER LINKS ADDED ACROS SK928 & SK929	1.2
02_E028	MJT	29/01/02	Production release	1.1

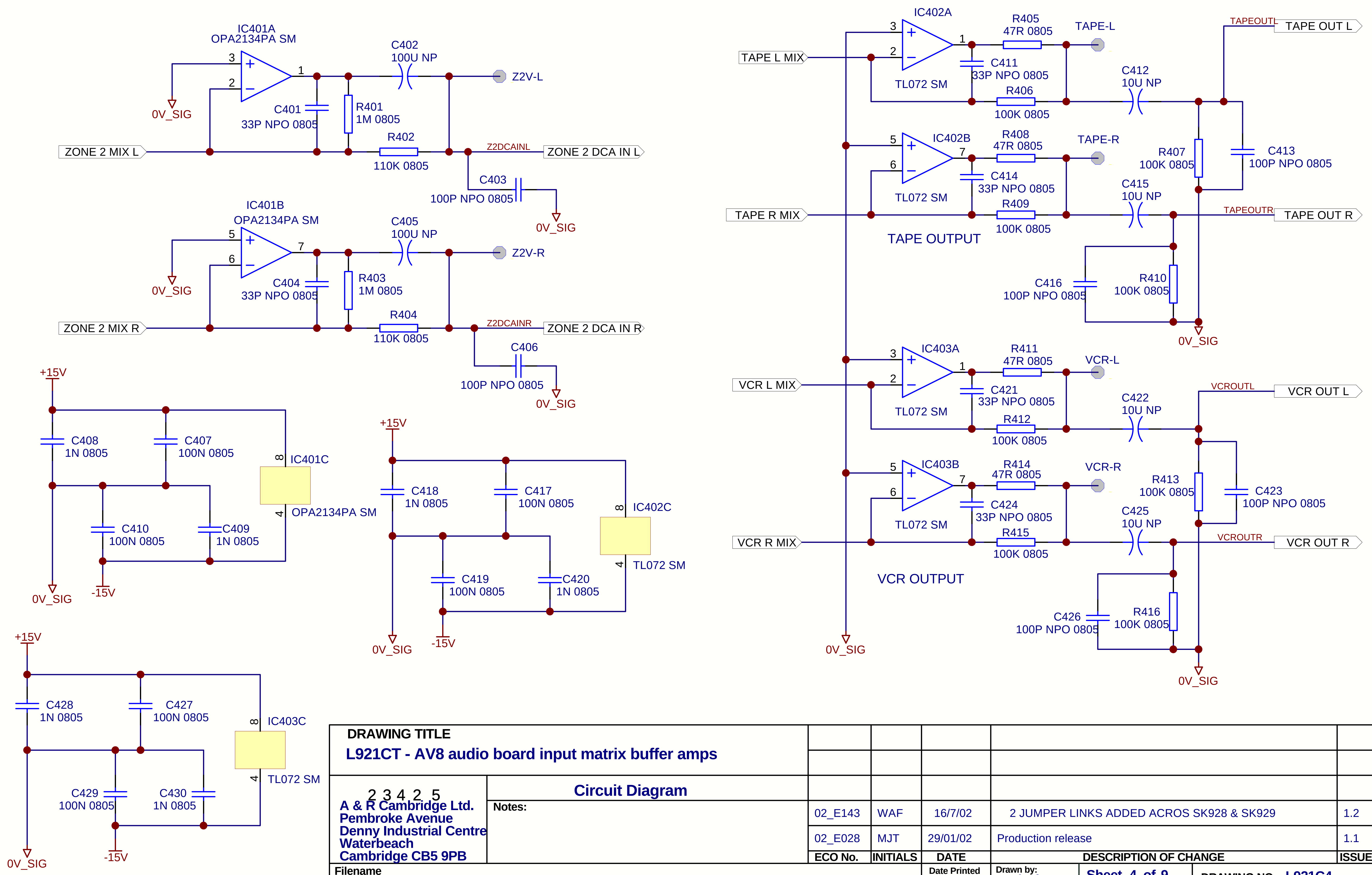
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Date Printed **16-Jul-2002**

Drawn by: **AD/SUBCON**

Sheet 3 of 9

DRAWING NO. **L921C3**



DRAWING TITLE

L921CT - AV8 audio board input matrix buffer amps

Circuit Diagram

2 3 4 2 5

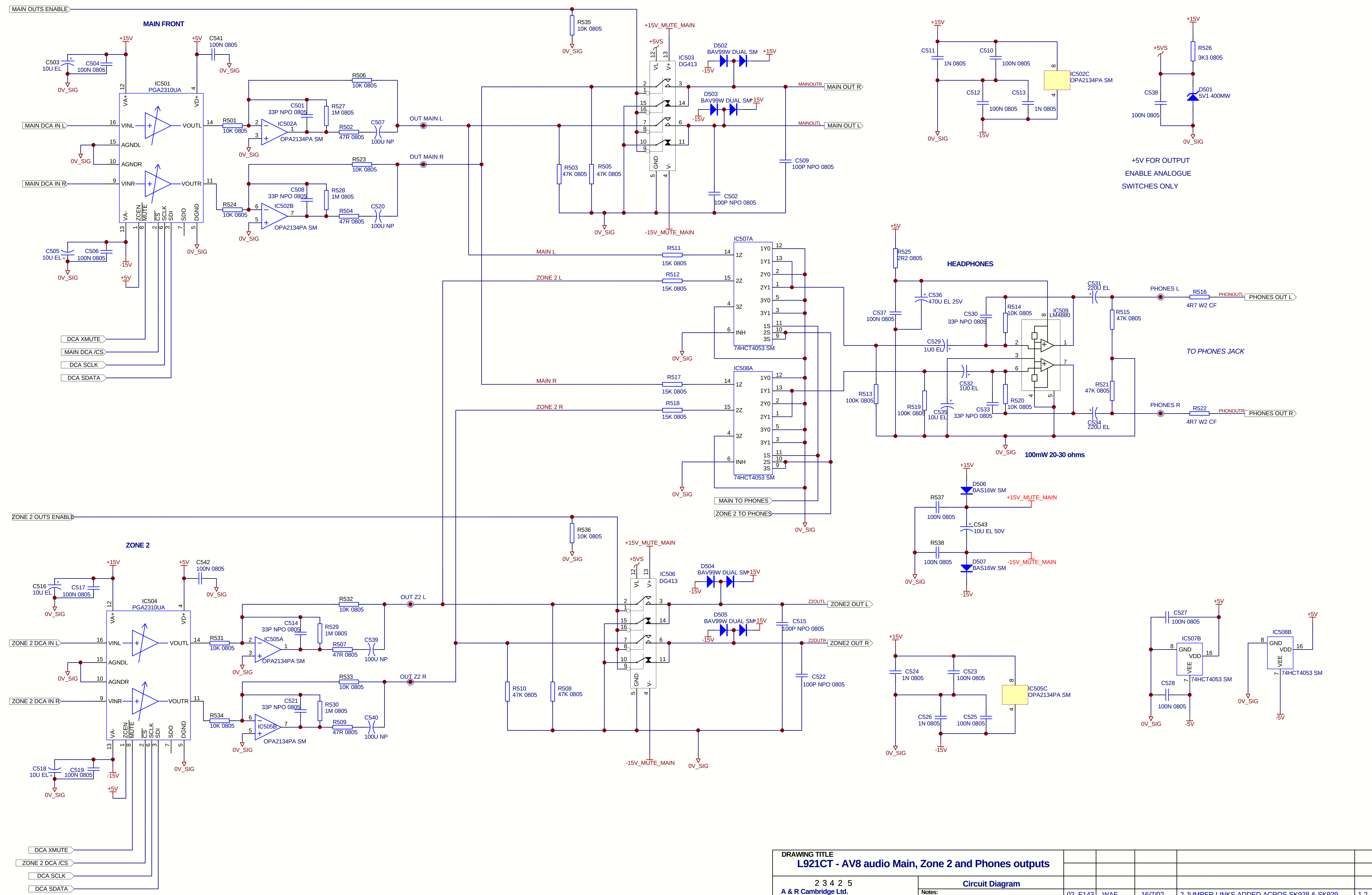
A & R Cambridge Ltd.
Pembroke Avenue
Denny Industrial Centre
Waterbeach
Cambridge CB5 9PB

Notes:

ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
02_E143	WAF	16/7/02	2 JUMPER LINKS ADDED ACROS SK928 & SK929	1.2
02_E028	MJT	29/01/02	Production release	1.1

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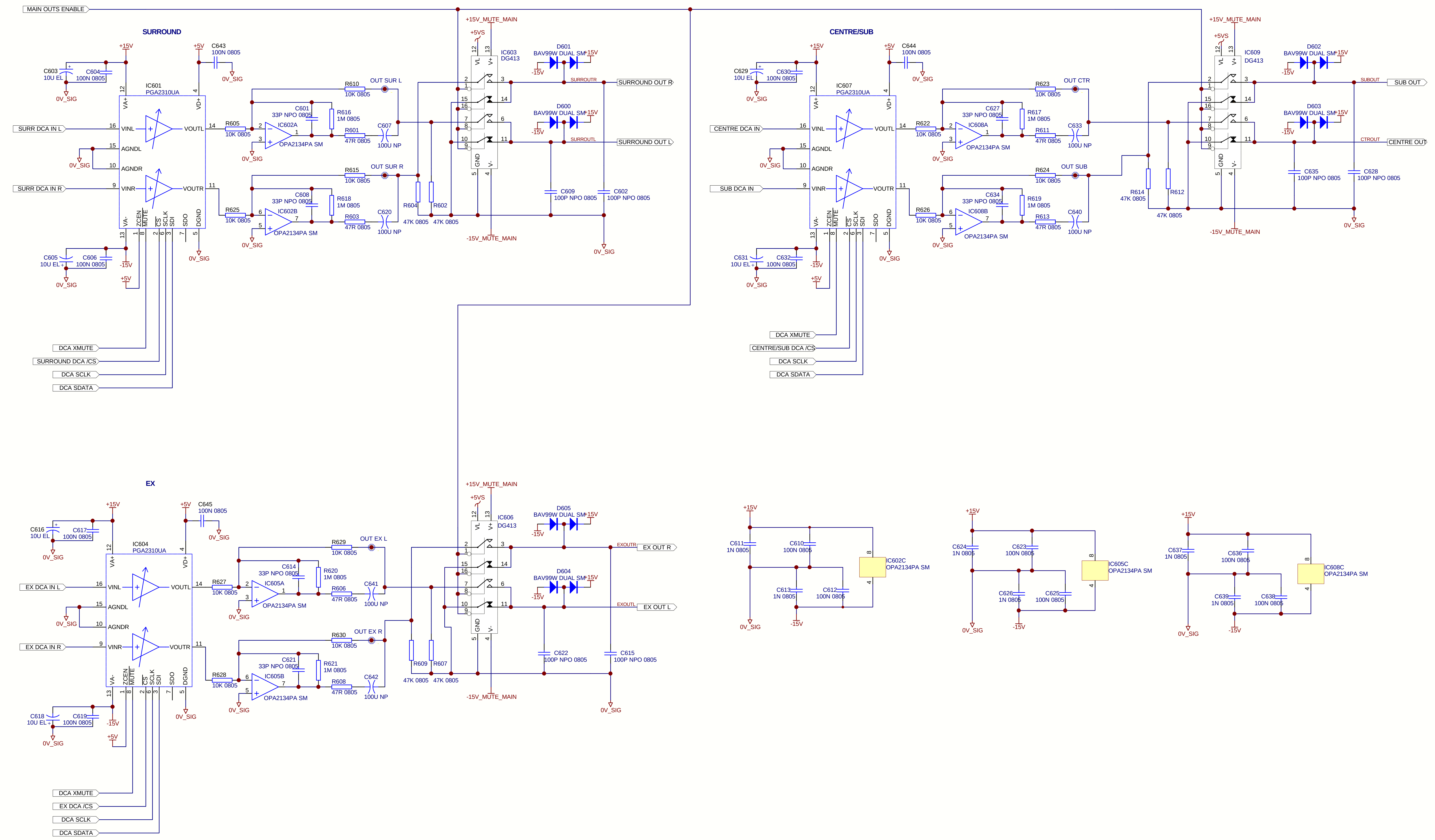
Date Printed: 16-Jul-2002
Drawn by: AD/subcon
Sheet 4 of 9
DRAWING NO. L921C4



DRAWING TITLE					
L921CT - AV8 audio Main, Zone 2 and Phones outputs					
2 3 4 2 5	Circuit Diagram				
A & R Cambridge Ltd. Pembroke Avenue Denny Industrial Centre Waterbeach Cambridge CB5 9PB	Notes:	02_E143	WAF	16/7/02	2 JUMPER LINKS ADDED ACROS SK928 & SK929	1.2
		02_E028	MJT	29/01/02	Production release	1.1
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE

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Date Printed 16-Jul-2002 | Drawn by: AD/subcon | Sheet 5 of 9 | DRAWING NO. L921C5



DRAWING TITLE

L921CT - AV8 audio Surround, Centre/Sub, & Ex outputs

2 3 4 2 5

Circuit Diagram

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02_E028	MJT	29/01/02	Production release	1.1

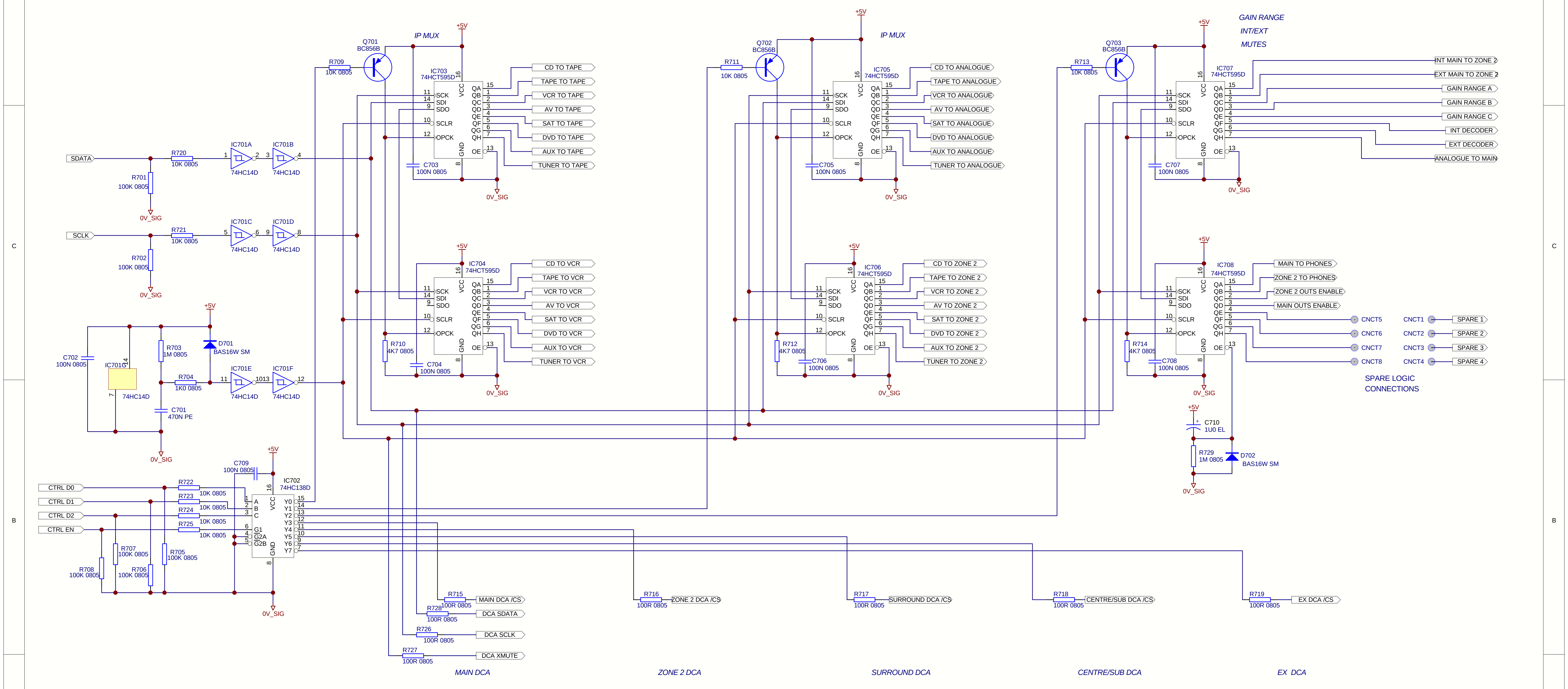
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Date Printed 16-Jul-2002

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Sheet 6 of 9

DRAWING NO. L921C6



DRAWING TITLE

L921CT - AV8 audio board control logic circuit

2 3 4 2 5

Circuit Diagram

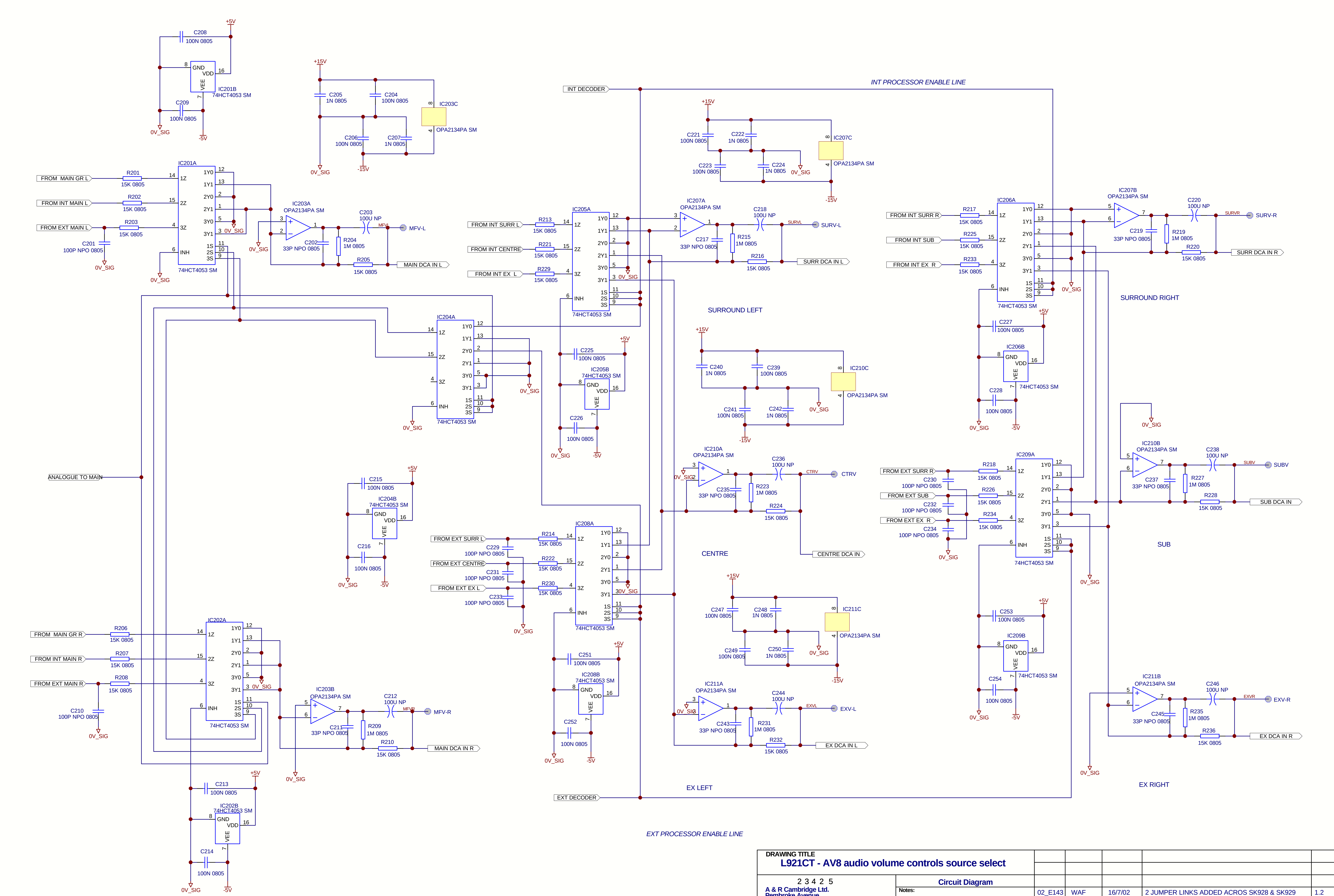
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02_E028	MJT	29/01/02	Production release	1.1

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Date Printed: 16-Jul-2002 | Drawn by: AD/subcon | Sheet 7 of 9 | DRAWING NO. L921C7



DRAWING TITLE

L921CT - AV8 audio volume controls source select

Circuit Diagram

2 3 4 2 5

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02_E028	MJT	29/01/02	Production release	1.1

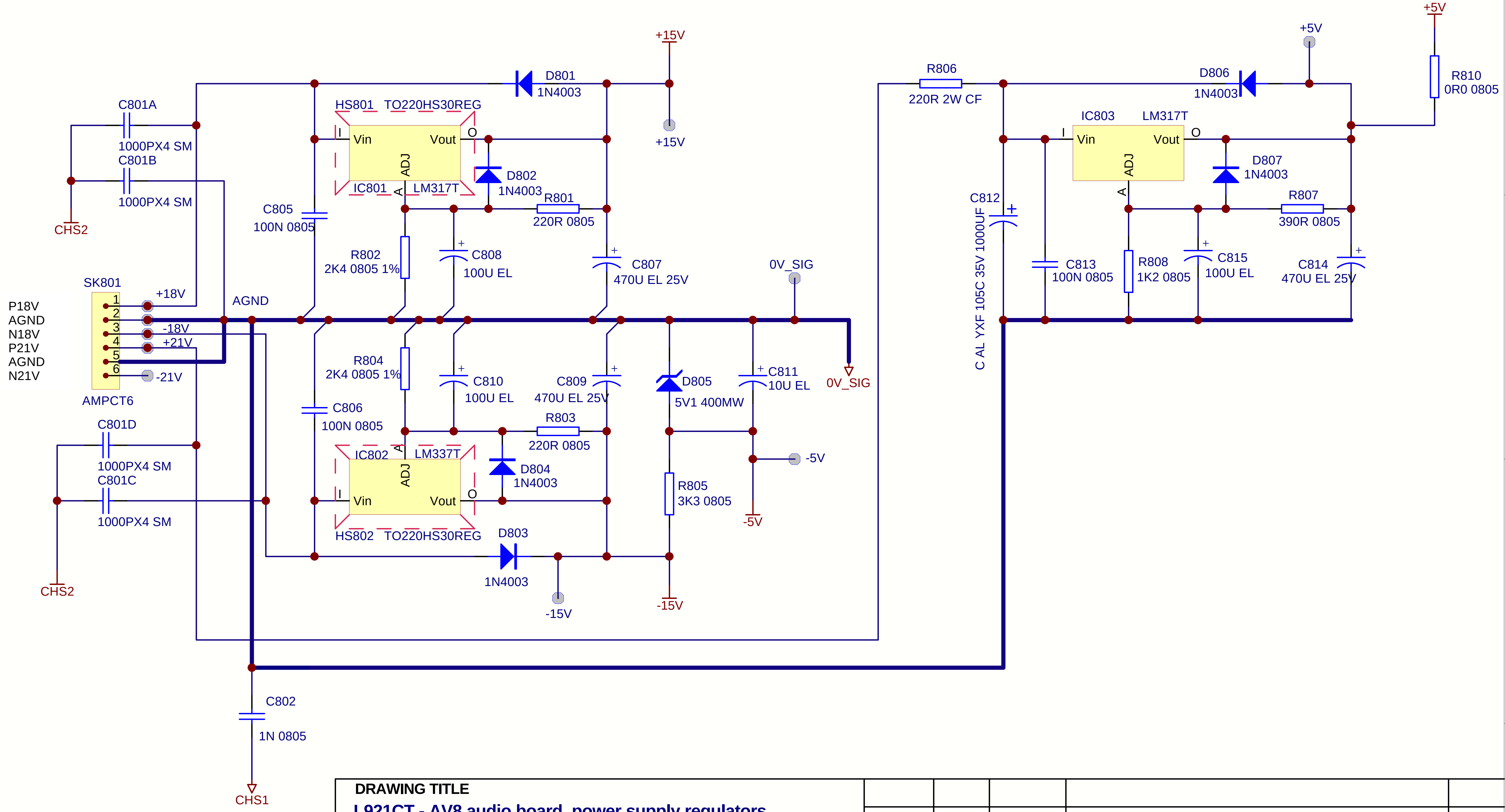
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Date Printed 16-Jul-2002

Drawn by:

Sheet 2 of 9

DRAWING NO. L921C2



DRAWING TITLE

L921CT - AV8 audio board power supply regulators

2 3 4 2 5

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Circuit Diagram

Notes:

ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
02_E143	WAF	16/7/02	2 JUMPER LINKS ADDED ACROS SK928 & SK929	1.2
02_E028	MJT	29/01/02	Production release	1.1

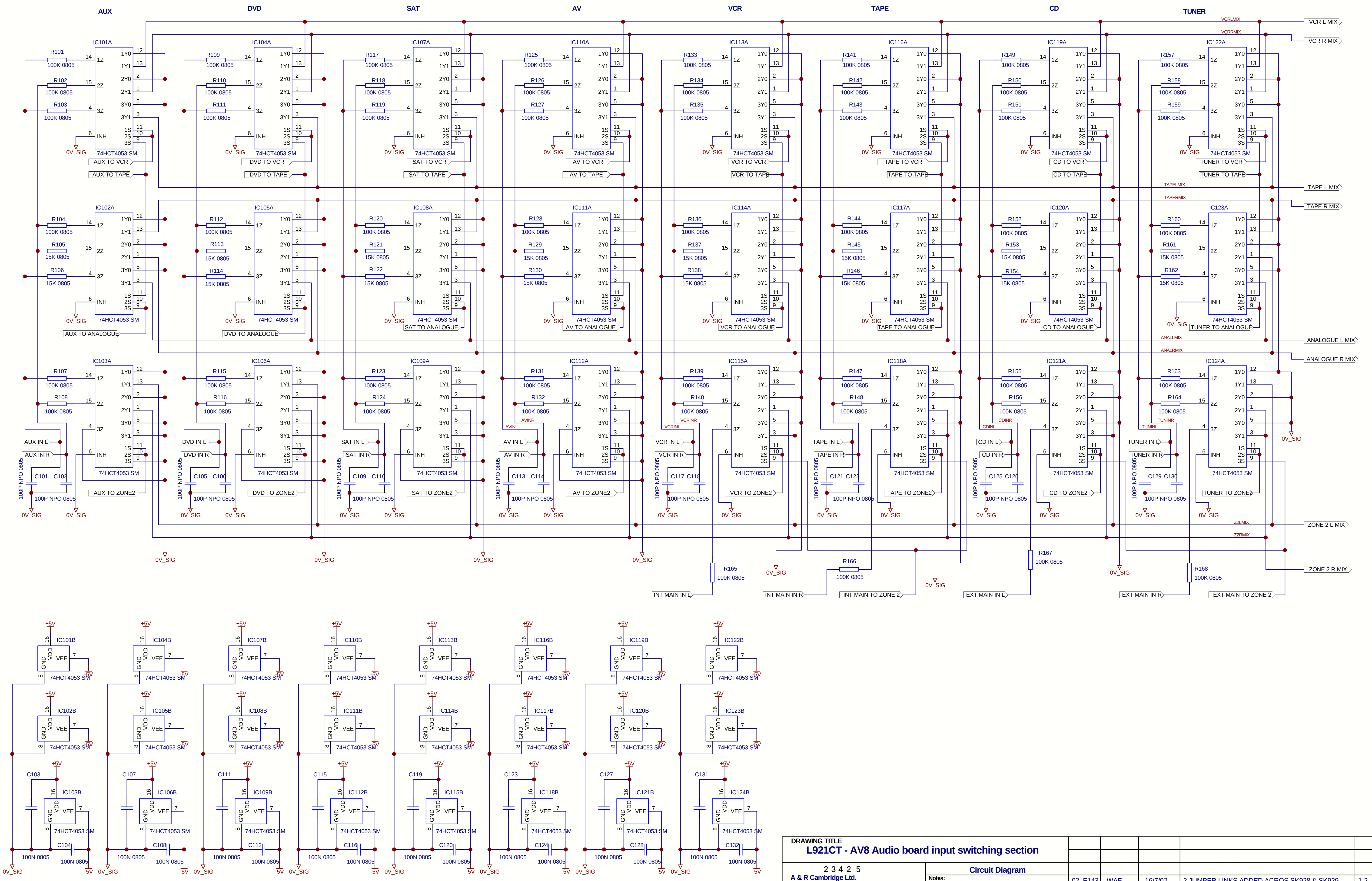
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Date Printed 16-Jul-2002

Drawn by: AD/subcon

Sheet 8 of 9

DRAWING NO. L921C8



DRAWING TITLE

L921CT - AV8 Audio board input switching section

Circuit Diagram

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Notes:

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02_E143	WAF	16/7/02	2 JUMPER LINKS ADDED ACROS SK928 & SK929	1.2
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Date Printed 16-Jul-2002 | Drawn by: AD/SUBCON | Sheet 1 of 9 | DRAWING NO. L921C1

Video Board L922

Contents

- Circuit description
- Component overlay
- Parts list
- Circuit diagrams

AV8 Video Board

Introduction

The L922 board is the video and I/O board for the AV8 preamp processor. This board and its snap off contain the video multiplexing for composite, s-video and component/RGB video switching as well as two On Screen display (OSD) chips, one for the main room and one for Zone 2. The PCB also has the SPDIF digital input multiplexing, RS232 connector, 12V triggers for zone 1 and 2, RC5 input for zone 1 and 2, RC5 output and the program button for reprogramming the micro controller flash memory.

The main video signal is not fed via OSD chip, instead the OSD signal is generated synchronised to the incoming Video and then cut into the video using a high speed multiplexer. The only part of the display that comes from the OSD chip is the text and its background.

This technique avoids the whole picture going soft whenever text is displayed however it introduces significant extra complexity.

Video PCB Icons + Mechanical
Refer to circuit diagram L922 sheet 1

This sheet contains drawing symbols to enter items on the run out BOM as well as the chassis fixing points and their associated EMC decoupling capacitors.

Video Board Top
Refer to circuit diagram L922 sheet 2

This sheet shows the interconnections between the different sheets within the Schematic Hierarchy. It also shows the snap off for the Headphone connector.

Video Board
Refer to circuit diagram L922 sheet 3

This snap of PCB contains the composite video inputs the composite multiplexer and the composite outputs and their mute circuits. The video inputs are 75R terminated then AC coupled to the inputs of two RHOM BA7625 5 : 2 multiplexers. These multiplexers have a gain of 2 (i.e. 6dB) expect to be AC coupled at the input and DC coupled at the output, if the input is inadvertently DC coupled it will shut down as the bias network will not operate. This could happen if any of the coupling caps are dc short at the input.

IC 200 is the main signal path multiplexer. Output 1 from the main multiplexer IC200 goes to the main PCB via the buffer IC203 and SK209 to the OSD chip. IC 202 is the VCR videotape loop it is buffered by IC203 then AC coupled and connected via a 75R series termination resistor to the RCA phono connector SK201.

IC201 is the Zone 2 multilexer output one from this is fed via the buffer IC203 and SK209 to the main PCB where it goes to the Zone 2 OSD chip.

The Buffer chip IC203 is a BA7623 video driver chip from RHOM, it expects to be DC coupled at the input and AC coupled at the output. If any DC current is drawn from the output the chip will shut down as the output bias network will not work. This could happen if any of the output caps are DC short.

The monitor 1 and 2 outputs and the Zone 2 output are fed directly from the main PCB via SK209 to the 75R series termination resistors, after the termination resistors are the mute transistors which pull to ground to shut down the output. This only provides about 20dB of mute however this is enough to shut down the sync so that a monitor will not recognise that a signal is present.

The multiplexers are controlled via the serial to parallel conversion latches IC204 and IC205. These are programmed by a 16bit data word. The clock for the data is (Video Serial CLK A) and the DATA is (Video serial data A), once all sixteen bits have been clocked into the latch the data is passed to the outputs by clocking the latch signal video comp latch.

Screen Display
Refer to circuit diagram L922 sheet 4

This sheet contains; the on screen display chip for the main zone 1, the input multiplexer for the onscreen display chip to select which type of video source to send to the OSD, the clock oscillators for PAL and NTSC generation, the clock multiplexer to select PAL or NTSC for each of the zones, the RGB output buffers and sync on green insertion, a sync separator and mono-stable to generate a black level clamp signal.

IC301 selects the input signal from the composite, S video or Y/G inputs, this signal is buffered by Q300 divided by two by the two 75R resistors then AC coupled into the input of the On Screen Display chip IC302. It is also possible to route the output of the OSD chip itself via this multiplexer to the input of the sync separator so that the black level clamp can still operate when the OSD chip is generating RGB or YUV signals.

IC302 is the On Screen Display chip it generates the text patterns which are multiplexed into the video using the fast blanking signal. Fast blanking is asserted whenever there is activity on the output of the OSD chip. The chip is programmed via a serial bus made up of the lines Video serial data, Video serial clk and Video serial cs. The Horizontal line lock is performed by a Phase Locked loop internal to the OSD chip the filter components for which are R349, C349 and C350.
LESCREEN input sets the screen intensity for the background and LECHAR sets the Screen intensity for the Characters. The potential dividers on the pins define the voltages.

The composite output of the OSD chip is sync tip clamped by the circuit made up of Q302 Q304 and D300. This circuit pulls the most negative part of the signal to a fixed voltage, in this case approximately 0v.

The sync tip clamp works in the following way. A fixed voltage of approximately 1.2v is generated by D300 and the 4K7 current limiting resistor R343, this holds the base of Q304 at 1.2v which in turn holds the base of Q302 at 0.6v. If the voltage on the collector of Q302 goes 0.6 v below the voltage on the base (i.e. below 0v) the darlington pairQ302 and Q304 turns on and dumps charge on the coupling capacitor C348 until the voltage is increased to 0v. So the most negative part of the signal always remains at 0v, the most negative part of a composite video signal is the sync and hence this is pulled to 0v.

This sync tip clamp circuit is used for all of the composite signals so they are all clamped to the same level. This

means that when the output of the OSD is switched into the output the DC level does not change avoiding any flickering or brightness changes.

The Y output is clamped to 0v at its sync tip by the transistor Q301. This is an active clamp that pulls the DC level to 0v every time a sync pulse occurs. The clamp signal is created from the composite sync stripped by the OSD chip IC302 this is the shortened to a ~700nS pulse by the mono stable IC308. The time of the pulse created by IC308 is set by R310 and C304. The clamp signal is also used to clamp the incoming Y signal of both S video and YUV signals. It is also used when the system is running in RGB mode to clamp the RGB signals to black level.

The RGB output is used when the system is operating in RGB mode and creates the colour information for the text being inserted. The level is reduced from TTL levels to video levels by the potential dividers that feed into video buffers made from the opamps IC300 and IC303. A sync signal can be added to the green output by activating the output of the AND gate IC502. This raises the DC level of the whole signal by 300mV then introduces 300mV syncs to 0V.

The PAL and NTSC clocks are generated by the CMOS oscillators. The oscillator is made by applying feedback around un-buffered 74HCU04 inverters. The oscillation is then buffered and amplified by some of the extra gates left in the 74HCU04 pack. Both oscillators run at all times so that the system can cope if Zone 1 is running NTSC and Zone 2 is running PAL. Which clock is used for the zone 1 and zone 2 OSD chips is controlled by the Tri-state buffers in IC305, these form a low noise 2:1 mux for the clocks.

RC5 I/O Triggers and RS232
Refer to circuit diagram L922 sheet 5

Sheet 5 has two RC5 demodulators made using IC400 and IC401, one RC5 mixer and buffer, two 100mA current limited trigger outputs, the RS232 output connector and the program button for reprogramming the Flash memory in the micro controller.

YUV/RGB Video Mux and OSD insert
Refer to circuit diagram L922 sheet 6

The circuit on this sheet multiplexes between the three RGB/YUV inputs using the high speed multiplexers IC503 and IC505. Once the signal has been selected it is AC coupled and DC restored using the active clamps Q511,Q500 and Q512. (operation of this clamp is described on sheet 4). The multiplexer following the DC restore IC506 inserts text using the fast blanking signal from the OSD chip. IC506 has a gain of 2 and 75R output capability to drive the output directly.

The type of signal that is inserted (RGB or YUV) is selected by the mux chip IC500A. The mux can select the signals from the RGB buffers on Sheet 4 for RGB operation or the Y output of the OSD chip and DC levels generated by the potential divider R519, R500 and R520,R522. These DC levels generate a blue background for the text when it is not being overlaid on the incoming video. IC501 switches between the blue background levels and zero volts the signal CHAR OUT is active when a character is present on the output and it is this that switches IC501. The OSD B and OSD G signals are In a logical AND with the Char Out signal to switch between blue & white colour. When the circuit is set to blue output, no green output & no char the colour is set to blue i.e it is back ground.

In any other condition the colour is set to white because it is a character i.e text is being displayed.
Zero volts is used when inserting characters as this provides a colourless background. I.e. the characters are white on a blue background.

Q503, Q504 and Q505 are used to mute the RGB output of the unit when it is not in use and at power up.

SPDIF MUX and RXTX
Refer to circuit diagram L922 sheet 7

The circuit on this sheet multiplexes the seven SPDIF inputs to a single line that is buffered and passed to the digital pcb.

The input signals are 75 R terminated then AC coupled into the multiplexer. The multiplexer is made up of The 2:1 CMOS switches IC600 IC601 and IC602. The multiplexer works in the same way as the audio multiplexers. It switches the signal between the input to the buffer circuit and a DC level at half the rail i.e. 2.5V. Each multiplexer has a independent select line, only one multiplexer should be selected at a time as the circuit will mix the signal together if more than one is selected.

After the input signal has been selected by the mux it is buffered and amplified by IC603. Applying feedback around a 74HCU04 biases it into the linear region. The three stages amplify the 0.5V P-P SPDIF signal up to a 5V logic level. Two outputs are buffered off of this logic level, one to go to the digital board the other is used for the digital record loop.

The digital record output is driven by IC605 either the buffered output of the input mux or the SPDIF output of the DSP (from the ADC input) can be selected. The signal is select by the lines SPDIF LOOP and SPDIF ADC TX. The 75R characteristic impedance is formed from the parallel combination of R613 100R, R626 680R and R627 680R. The digital output is AC coupled.

Control of all of the select lines for the Multiplexers and Buffers is handled by IC604 and IC606. IC604 and IC606 are latched serial to parallel converters.

SVIDEO and CVBS OSD insert
Refer to circuit diagram L922 sheet 8

The circuits on this sheet switch the OSD generated test into the incoming video. IC700 is the fast video switch that inserts the text, it is controlled by the fast banking signal directly out of the OSD chip. IC700 has a gain of 2 and can drive 75R loads.

The composite video signal is sync tip clamped at the input to the switch by Q701 and Q705 this works in the same way as the Sync tip clamp on sheet 4 that operates on the composite signal out of the OSD chip. These two sync tip clamps ensure that the DC level is the same at the input to the switch so that the text is switched in at the correct DC level.

The S-video Y input is actively clamped by the clamp signal as described on sheet 4. This ensures that the two S-video Y inputs, one from the input source and the other from OSD, are at the same DC level. Ensuring the DC levels are correct means the text can be inserted at the correct level.

The S-video C and OSD C signals do not need a DC clamp as they will float to the same level due to the nature of the signal.

S-Video Multiplexer
Refer to circuit diagram L922 sheet 9

This contains the multiplexing for the S-Video signals. It operates in the same way as the composite multiplexer (Sheet 3 Video board) except two multiplexers are used for each signal to carry the independent Luma and Chroma signals.

IC800 and IC807 carry the main feed Luma and Chroma respectively. IC801 and IC806 carry the VCR record loop Chroma and Luma respectively. The Main feed is buffered by IC803 it then goes to the OSD insert sheet, the VCR output is buffered by IC802 and then output to the VCR connector.

Control of the Multiplexer is via serial to parallel shift registers IC804, IC805 and IC808 these also have the control lines for the SCART control signals, sync on green and the Mute signals.

Zone 2 OSD
Refer to circuit diagram L922 sheet 10

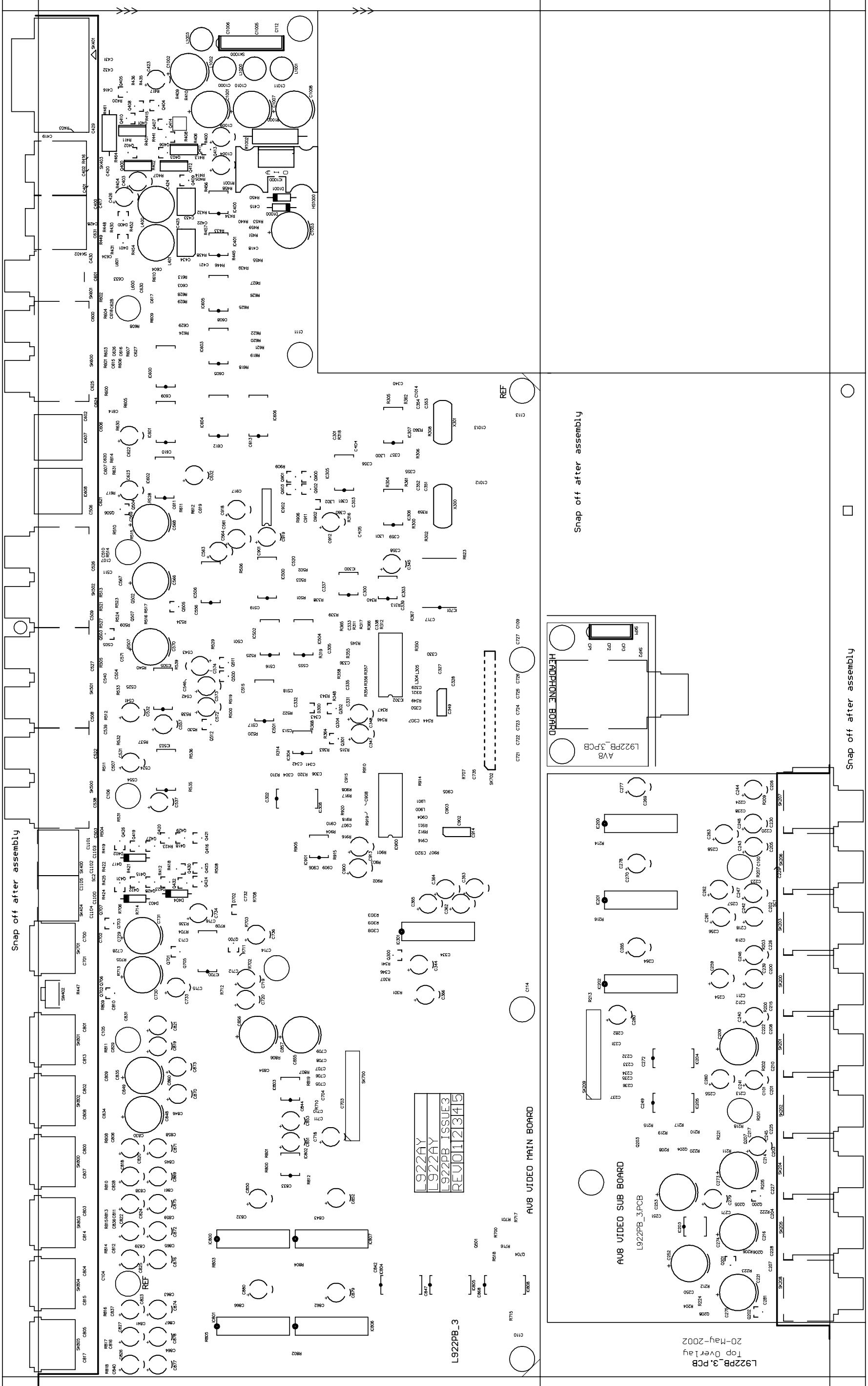
This contains the OSD sync stripper and OSD insert circuits for Zone 2. It works in a very similar way to the circuits on sheets 4 and 8 combined together. As Zone 2 only operates in composite the circuit is without the extra multiplexing for S-Video and Component signals.

The Zone 2 video comes from the video input sheet 3 buffer it is terminated on this sheet then fed to both the OSD chip IC900 and the OSD insert multiplexer (Pixel Switch)IC902. Characters are generated by the OSD and this signal is present on the second input to the pixel switch. Both of the signal are sync tip clamped by transistors Q900, Q901, this means that their DC levels at the input to the pixel switch should be about the same.

The fast blanking signal from the OSD controls the position of the pixel switch. Fast blanking is high when OSD characters are being generated this causes the pixel switch to change to the output from the OSD chip. The pixel switch IC902 has a video buffer output and a gain of two. This buffered output is fed back to the Video board (sheet 3) and out via the Zone 2 connector.

The vertical sync output of the sync separator IC901 is used to determine if the incoming video is PAL or NTSC so that the correct clock can be provided to the OSD chip.

- Vertical sync 50Hz = PAL 17.73447MHz
- Vertical sync 60Hz = NTSC 14.31818MHz



Snap off after assembly
AV8 VIDEO MAIN BOARD
AV8 VIDEO SUB BOARD
L922PB_3.PCB
HEADPHONE BOARD
AV8
L922PB_3.PCB
L922AY
L922AY
L922PB ISSUE3
REV 0 1 2 3 4 5
L922PB_3
REF
L922PB_3.PCB
Top Overlay
20-May-2002

L922 Video Board Parts List Issue 3.2

Designator	Part	Description
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C101	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C104	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C105	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C106	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C107	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C109	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C110	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C111	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C112	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C113	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C114	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C200	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C201	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C202	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C203	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C204	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C205	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C206	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C207	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C208	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C209	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C210	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C211	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C212	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C213	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C214	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C215	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C216	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C217	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C218	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C219	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C220	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C221	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C222	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C223	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C224	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C225	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C226	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C227	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C228	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C229	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C230	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C231	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C232	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C233	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C234	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C235	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C236	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C237	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C238	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C239	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C240	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C241	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C242	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C243	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C244	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C245	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C246	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C247	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C248	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C249	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N

L922 Video Board Parts List Issue 3.2

Designator	Part	Description
C250	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C251	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C252	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C253	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C254	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C255	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C256	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C257	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C258	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C259	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C260	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C261	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C262	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C263	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C264	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C265	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C269	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C270	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C271	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C272	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C273	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C274	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C275	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C277	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C278	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C279	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C280	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C281	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C282	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C300	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C301	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C302	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C303	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C304	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C305	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C306	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C307	2L168	Capacitor SM 0805 NPO Ceramic 5% 100V 680P
C308	2L168	Capacitor SM 0805 NPO Ceramic 5% 100V 680P
C327	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C328	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C329	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C330	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C331	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C332	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C333	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C334	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C335	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C336	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C337	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C338	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C339	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C340	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C341	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C342	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C343	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C344	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C345	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C346	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C347	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C348	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C349	2KA315	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 15N
C350	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P

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Designator	Part	Description
C351	2L027	Capacitor SM 0805 NPO Ceramic 5% 100V 27P
C352	2L027	Capacitor SM 0805 NPO Ceramic 5% 100V 27P
C353	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C354	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C355	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C356	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C357	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C358	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C359	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C360	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C361	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C362	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C363	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C364	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C365	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C366	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C400	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C401	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C402	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C403	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C404	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C405	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C415	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C416	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C417	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C418	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C419	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C420	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C421	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C422	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C423	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C424	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C425	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C426	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C428	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C429	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C430	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C431	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C432	2L022	Capacitor SM 0805 NPO Ceramic 5% 100V 22P
C433	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C434	2D168	Capacitor Boxed Polyprop 5mm Pitch 63V 5% 680P
C501	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C503	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C504	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C505	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C506	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C507	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C508	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C509	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C510	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C511	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C513	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C515	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C516	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C517	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C518	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C519	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C520	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C522	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C524	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C525	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C526	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N

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Designator	Part	Description
C527	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C531	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C532	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C537	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C538	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C539	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C540	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C541	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C542	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C543	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C546	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C554	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C555	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C556	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C557	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C561	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C563	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C564	2N647	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 47UF 35V
C566	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C567	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C568	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C569	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C570	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C571	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C572	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C573	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C574	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C600	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C601	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C602	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C603	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C604	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C605	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C606	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C607	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C608	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C609	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C610	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C611	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C612	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C613	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C614	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C615	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C616	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C617	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C618	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C619	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C620	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C621	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C622	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C623	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C624	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C625	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C626	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C627	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C628	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C629	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C630	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C631	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C632	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C633	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C634	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P

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Designator	Part	Description
C700	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C701	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C702	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C703	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C704	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C705	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C706	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C707	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C708	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C709	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C710	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C711	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C712	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C713	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C714	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C715	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C716	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C717	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C718	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C719	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C720	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C721	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C722	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C723	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C724	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C725	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C726	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C727	2W110X4	Capacitor Network SM 0612 NP0 100P X 4 50V
C728	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C729	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C730	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C731	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C732	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C733	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C734	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C735	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C736	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C800	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C801	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C802	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C803	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C804	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C805	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
C806	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C807	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C808	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C809	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C810	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C811	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C812	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C813	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C814	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C815	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C816	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C817	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C818	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C819	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C820	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C821	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C822	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C823	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C824	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V

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Designator	Part	Description
C825	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C826	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C827	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C828	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C829	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C830	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C831	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C832	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C833	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C834	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C835	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C836	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C837	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C838	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C839	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C840	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C841	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C842	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C843	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C844	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C845	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C846	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C847	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C848	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C849	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C850	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C851	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C852	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C853	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C854	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C855	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C856	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C857	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C858	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C859	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C860	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C861	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C862	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C863	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C864	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C865	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C866	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C867	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C868	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C869	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C870	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C871	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C872	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C873	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C874	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C875	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C876	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C877	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C878	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C879	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C880	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C900	2N522	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 2U2 50V
C901	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C902	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C903	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C904	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C905	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N

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Designator	Part	Description
C906	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C907	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C908	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C909	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C910	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C911	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C912	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C913	2N510	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 1UF 50V
C914	2KA315	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 15N
C915	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C916	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C917	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C918	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C919	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C920	2L168	Capacitor SM 0805 NPO Ceramic 5% 100V 680P
C1000	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1001	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C1002	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C1003	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C1004	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C1005	2W210X4	Capacitor Network SM 0612 NP0 Ceramic 1000P X 4 50V
C1006	2W210X4	Capacitor Network SM 0612 NP0 Ceramic 1000P X 4 50V
C1007	2N810A	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 1000UF 10V
C1008	2N810A	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 1000UF 10V
C1009	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C1010	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1011	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1012	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1013	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1014	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1100	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C1101	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C1102	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C1103	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C1104	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C1105	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
CP1	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
CP2	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
CP3	2J210	Capacitor SM 0805 X7R Ceramic 10% 50V 1N
D300	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D400	3CW34V7	Zener Diode 0.25W Surface Mount BZX84C4V7 SOT-23 Package
D401	3CW34V7	Zener Diode 0.25W Surface Mount BZX84C4V7 SOT-23 Package
D402	3C05604	Zener Diode 0.5W BZX79C5V6 DO-35 Package
D403	3C11004	Zener Diode 0.5W BZX79C10V DO-35 Package
D404	3C05604	Zener Diode 0.5W BZX79C5V6 DO-35 Package
D702	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D902	3AV99W	Diode Dual Surface Mount Small Signal BAV99 SOT-23 Package
D1000	3B4003	Diode 1N4003 DO-41 Package
D1001	3B4003	Diode 1N4003 DO-41 Package
HS1000	F004	HEATSINK BLACK TO220 23.7 degC/W
IC200	5V7625	IC MUX VIDEO ROHM BA7625 DIP-16 PACKAGE
IC201	5V7625	IC MUX VIDEO ROHM BA7625 DIP-16 PACKAGE
IC202	5V7625	IC MUX VIDEO ROHM BA7625 DIP-16 PACKAGE
IC203	5V7623	IC VIDEO BUFFER ROHM BA7623F SO-8 PACKAGE
IC204	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC205	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC300	5B5244	Opamp EL5244CS SO-8 Package
IC301	5V7625	IC MUX VIDEO ROHM BA7625 DIP-16 PACKAGE
IC302	5V5730	IC OSD ST STV5730A SO-28 package
IC303	5B5244	Opamp EL5244CS SO-8 Package
IC304	5V4581	IC Video Sync Separator 50% slice SO-8 Package
IC305	5K74125T	IC QUAD BUFFER 74HCT125D SMT

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Designator	Part	Description
IC306	5K7404	IC HEX INVERTER 74HCU04D SMT
IC307	5K7404	IC HEX INVERTER 74HCU04D SMT
IC308	5K74123	IC DUAL RETRIGGERABLE MONOSTABLE WITH RESET 74HC123D PLASTIC SO-16
IC400	5M393AD	IC COMPARATORLM393AM SO-8 PACKAGE
IC401	5M393AD	IC COMPARATORLM393AM SO-8 PACKAGE
IC500	5K4053	IC TRIPLE 2 CHANNEL ANALOGUE MUX 74LV4053D SMT
IC501	5K4053	IC TRIPLE 2 CHANNEL ANALOGUE MUX 74LV4053D SMT
IC502	5K7408	IC QUAD 2-INPUT AND GATE 74HC08D SM
IC503	5V4331	IC VIDEO MUX 300MHZ EL4331CS SO-16
IC504	5K7404	IC HEX INVERTER 74HCU04D SMT
IC505	5V4331	IC VIDEO MUX 300MHZ EL4331CS SO-16
IC506	5A4332	IC VIDEO MUX TRIPLE 300MHZ SO-16 package
IC600	5K4053	IC TRIPLE 2 CHANNEL ANALOGUE MUX 74LV4053D SMT
IC601	5K4053	IC TRIPLE 2 CHANNEL ANALOGUE MUX 74LV4053D SMT
IC602	5K4053	IC TRIPLE 2 CHANNEL ANALOGUE MUX 74LV4053D SMT
IC603	5K7404	IC HEX INVERTER 74HCU04D SMT
IC604	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC605	5K74125T	IC QUAD BUFFER 74HCT125D SMT
IC606	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC607	5TG550R	SPDIF OPTICAL RX TOSLINK GP1FA550RZ
IC608	5TG550R	SPDIF OPTICAL RX TOSLINK GP1FA550RZ
IC700	5A4332	IC VIDEO MUX TRIPLE 300MHZ SO-16 package
IC701	5K74244T	IC OCTAL 3 STATE BUFFER 74HCT244D SMT
IC800	5V7625	IC MUX VIDEO ROHM BA7625 DIP-16 PACKAGE
IC801	5V7625	IC MUX VIDEO ROHM BA7625 DIP-16 PACKAGE
IC802	5V7623	IC VIDEO BUFFER ROHM BA7623F SO-8 PACKAGE
IC803	5V7623	IC VIDEO BUFFER ROHM BA7623F SO-8 PACKAGE
IC804	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC805	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC806	5V7625	IC MUX VIDEO ROHM BA7625 DIP-16 PACKAGE
IC807	5V7625	IC MUX VIDEO ROHM BA7625 DIP-16 PACKAGE
IC808	5K595	IC 8 BIT SERIAL TO PARALLEL LATCH 74HCT595D SMT
IC900	5V5730	IC OSD ST STV5730A SO-28 package
IC901	5V4581	IC Video Sync Separator 50% slice SO-8 Package
IC902	5A4332	IC VIDEO MUX TRIPLE 300MHZ SO-16 package
IC1000	5D337	IC VOLTAGE REGULATOR NEG ADJ LM337T TO-220 PACKAGE
L300	7F004	Ferrite Bead SM1206 70R@100MHz
L301	7F004	Ferrite Bead SM1206 70R@100MHz
L302	7F004	Ferrite Bead SM1206 70R@100MHz
L304	7F004	Ferrite Bead SM1206 70R@100MHz
L305	7F004	Ferrite Bead SM1206 70R@100MHz
L400	7D327	Inductor 27mH 5% SCREENED
L401	7D327	Inductor 27mH 5% SCREENED
L600	7F004	Ferrite Bead SM1206 70R@100MHz
L601	7E101	Common Mode Choke 1000R@100MHz
L900	7F004	Ferrite Bead SM1206 70R@100MHz
L901	7F004	Ferrite Bead SM1206 70R@100MHz
L1000	7D968A	Inductor 6U8
L1001	7D968A	Inductor 6U8
L1002	7D968A	Inductor 6U8
L1003	7D968A	Inductor 6U8
PCB	L922PB	BLANK PCB AV8 VIDEO BOARD
Q200	4A849B	Transistor BC849B SOT23 Package
Q201	4A849B	Transistor BC849B SOT23 Package
Q202	4A849B	Transistor BC849B SOT23 Package
Q203	4A849B	Transistor BC849B SOT23 Package
Q204	4A849B	Transistor BC849B SOT23 Package
Q205	4A849B	Transistor BC849B SOT23 Package
Q206	4A849B	Transistor BC849B SOT23 Package
Q207	4A849B	Transistor BC849B SOT23 Package
Q208	4A849B	Transistor BC849B SOT23 Package
Q300	4A859B	Transistor BC859B SOT23 Package

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Designator	Part	Description
Q301	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q302	4D17H	Transistor BFS17H SOT23 Package
Q304	4D17H	Transistor BFS17H SOT23 Package
Q400	4B180	Transistor BD180 TO126 Package
Q401	4B180	Transistor BD180 TO126 Package
Q402	4A859B	Transistor BC859B SOT23 Package
Q403	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q404	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q405	4A859B	Transistor BC859B SOT23 Package
Q406	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q407	4A849B	Transistor BC849B SOT23 Package
Q408	4A849B	Transistor BC849B SOT23 Package
Q409	4A859B	Transistor BC859B SOT23 Package
Q410	4A859B	Transistor BC859B SOT23 Package
Q411	4B180	Transistor BD180 TO126 Package
Q412	4B180	Transistor BD180 TO126 Package
Q413	4A859B	Transistor BC859B SOT23 Package
Q414	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q415	4A859B	Transistor BC859B SOT23 Package
Q416	4A859B	Transistor BC859B SOT23 Package
Q417	4AFMMT597	Transistor FMMT597 SOT23 Package
Q418	4AFMMT597	Transistor FMMT597 SOT23 Package
Q419	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q420	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q421	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q422	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q423	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q424	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q425	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q426	4D10KP	Transistor MMUN2111LT1 SOT23 Package
Q427	4D10KP	Transistor MMUN2111LT1 SOT23 Package
Q428	4D10KP	Transistor MMUN2111LT1 SOT23 Package
Q429	4D10KP	Transistor MMUN2111LT1 SOT23 Package
Q430	4D10KP	Transistor MMUN2111LT1 SOT23 Package
Q431	4D10KP	Transistor MMUN2111LT1 SOT23 Package
Q432	4D10KP	Transistor MMUN2111LT1 SOT23 Package
Q500	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q501	4A849B	Transistor BC849B SOT23 Package
Q502	4A849B	Transistor BC849B SOT23 Package
Q503	4A849B	Transistor BC849B SOT23 Package
Q504	4A849B	Transistor BC849B SOT23 Package
Q505	4A849B	Transistor BC849B SOT23 Package
Q506	4A849B	Transistor BC849B SOT23 Package
Q507	4A849B	Transistor BC849B SOT23 Package
Q511	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q512	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q700	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q701	4D17H	Transistor BFS17H SOT23 Package
Q702	4A849B	Transistor BC849B SOT23 Package
Q703	4A849B	Transistor BC849B SOT23 Package
Q704	4A849B	Transistor BC849B SOT23 Package
Q705	4D17H	Transistor BFS17H SOT23 Package
Q706	4A849B	Transistor BC849B SOT23 Package
Q707	4A849B	Transistor BC849B SOT23 Package
Q900	4D17H	Transistor BFS17H SOT23 Package
Q901	4D17H	Transistor BFS17H SOT23 Package
Q902	4D17H	Transistor BFS17H SOT23 Package
Q903	4D17H	Transistor BFS17H SOT23 Package
R200	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R201	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R202	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R203	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R

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Designator	Part	Description
R204	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R205	1M036	Resistor 0805 Surface Mount 0.125W 1% 36R
R206	1M036	Resistor 0805 Surface Mount 0.125W 1% 36R
R207	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R208	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R209	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R210	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R211	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R212	1M036	Resistor 0805 Surface Mount 0.125W 1% 36R
R213	1M115	Resistor 0805 Surface Mount 0.125W 1% 150R
R214	1M115	Resistor 0805 Surface Mount 0.125W 1% 150R
R215	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R216	1M115	Resistor 0805 Surface Mount 0.125W 1% 150R
R217	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R218	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R219	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R220	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R221	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R222	1M039	Resistor 0805 Surface Mount 0.125W 1% 39R
R223	1M039	Resistor 0805 Surface Mount 0.125W 1% 39R
R224	1M039	Resistor 0805 Surface Mount 0.125W 1% 39R
R300	1M468	Resistor 0805 Surface Mount 0.125W 1% 680K
R301	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R302	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R303	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R304	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R305	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R306	1M468	Resistor 0805 Surface Mount 0.125W 1% 680K
R307	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R308	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R309	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R310	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R311	1M282	Resistor 0805 Surface Mount 0.125W 1% 8K2
R312	1M268	Resistor 0805 Surface Mount 0.125W 1% 6K8
R313	1M282	Resistor 0805 Surface Mount 0.125W 1% 8K2
R314	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R315	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R316	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R317	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R318	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R319	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R320	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R321	1M522	Resistor 0805 Surface Mount 0.125W 1% 2M2
R336	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R338	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R339	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R340	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R341	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R343	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R344	1M256	Resistor 0805 Surface Mount 0.125W 1% 5K6
R345	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R346	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R347	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R348	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R349	1M330	Resistor 0805 Surface Mount 0.125W 1% 30K
R350	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R354	1M227	Resistor 0805 Surface Mount 0.125W 1% 2K7
R355	1M227	Resistor 0805 Surface Mount 0.125W 1% 2K7
R356	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R357	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R358	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R359	1M547	Resistor 0805 Surface Mount 0.125W 1% 4M7

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Designator	Part	Description
R360	1M547	Resistor 0805 Surface Mount 0.125W 1% 4M7
R361	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R362	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R363	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R364	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R365	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R366	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R367	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R368	1M468	Resistor 0805 Surface Mount 0.125W 1% 680K
R400	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R401	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R402	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R403	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R404	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R405	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R406	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R407	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R408	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R409	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R410	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R411	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R412	1M010	Resistor 0805 Surface Mount 0.125W 1% 10R
R413	1M868	Resistor 0805 Surface Mount 0.125W 1% 6R8
R414	1M868	Resistor 0805 Surface Mount 0.125W 1% 6R8
R415	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R416	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R417	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R418	1M010	Resistor 0805 Surface Mount 0.125W 1% 10R
R419	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R420	1M010	Resistor 0805 Surface Mount 0.125W 1% 10R
R421	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R422	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R423	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R424	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R425	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R430	1M147	Resistor 0805 Surface Mount 0.125W 1% 470R
R431	1M147	Resistor 0805 Surface Mount 0.125W 1% 470R
R432	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R433	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R434	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R435	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R436	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R438	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R439	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R440	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R441	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R445	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R446	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R447	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R448	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R449	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R450	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R451	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R452	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R453	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R454	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R455	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R456	1M218	Resistor 0805 Surface Mount 0.125W 1% 1K8
R457	1M218	Resistor 0805 Surface Mount 0.125W 1% 1K8
R458	1M215	Resistor 0805 Surface Mount 0.125W 1% 1K5
R459	1M215	Resistor 0805 Surface Mount 0.125W 1% 1K5
R461	1E147	Resistor Carbon Film 1W 5% 470R

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Designator	Part	Description
R464	1M010	Resistor 0805 Surface Mount 0.125W 1% 10R
R500	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R501	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R502	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R503	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R504	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R505	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R506	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R507	1M039	Resistor 0805 Surface Mount 0.125W 1% 39R
R508	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R509	1M036	Resistor 0805 Surface Mount 0.125W 1% 36R
R510	1M036	Resistor 0805 Surface Mount 0.125W 1% 36R
R511	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R512	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R513	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R514	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R515	1M039	Resistor 0805 Surface Mount 0.125W 1% 39R
R516	1M039	Resistor 0805 Surface Mount 0.125W 1% 39R
R517	1M036	Resistor 0805 Surface Mount 0.125W 1% 36R
R518	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R519	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R520	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R521	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R522	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R523	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R524	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R525	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R527	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R528	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R529	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R530	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R531	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R532	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R533	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R534	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R535	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R536	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R537	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R538	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R539	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R540	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R600	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R601	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R602	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R603	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R604	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R605	1M156	Resistor 0805 Surface Mount 0.125W 1% 560R
R606	1M156	Resistor 0805 Surface Mount 0.125W 1% 560R
R607	1M156	Resistor 0805 Surface Mount 0.125W 1% 560R
R608	1M156	Resistor 0805 Surface Mount 0.125W 1% 560R
R609	1M156	Resistor 0805 Surface Mount 0.125W 1% 560R
R610	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R611	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R612	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R613	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R614	1M156	Resistor 0805 Surface Mount 0.125W 1% 560R
R617	1M156	Resistor 0805 Surface Mount 0.125W 1% 560R
R618	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R619	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R620	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R621	1M468	Resistor 0805 Surface Mount 0.125W 1% 680K
R622	1M468	Resistor 0805 Surface Mount 0.125W 1% 680K

L922 Video Board Parts List Issue 3.2

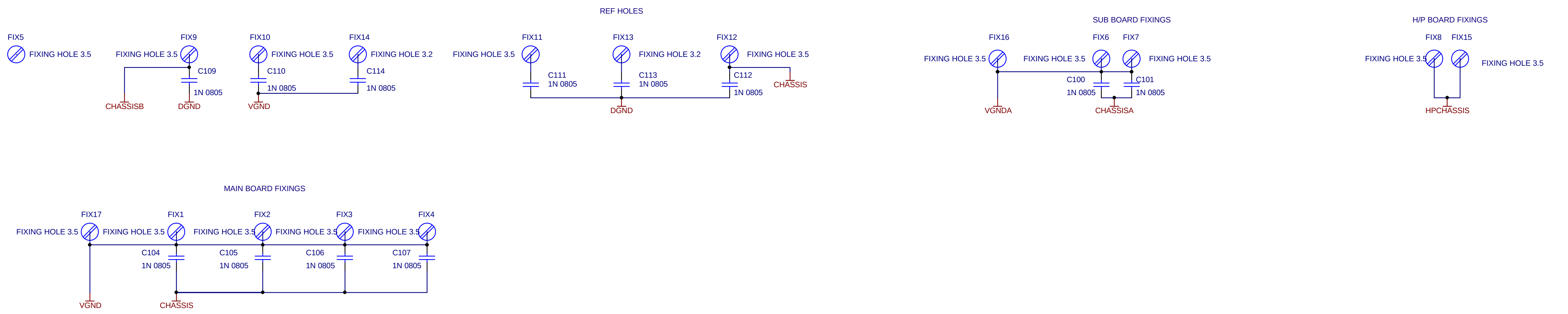
Designator	Part	Description
R623	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R624	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R625	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R626	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R627	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R628	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R629	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R630	1M010	Resistor 0805 Surface Mount 0.125W 1% 10R
R631	1M010	Resistor 0805 Surface Mount 0.125W 1% 10R
R700	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R701	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R702	1M115	Resistor 0805 Surface Mount 0.125W 1% 150R
R703	1M116	Resistor 0805 Surface Mount 0.125W 1% 160R
R704	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R705	1M036	Resistor 0805 Surface Mount 0.125W 1% 36R
R706	1M036	Resistor 0805 Surface Mount 0.125W 1% 36R
R707	1M022	Resistor 0805 Surface Mount 0.125W 1% 22R
R708	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R709	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R710	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R711	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R712	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R713	1M039	Resistor 0805 Surface Mount 0.125W 1% 39R
R714	1M039	Resistor 0805 Surface Mount 0.125W 1% 39R
R715	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R716	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R717	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R800	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R801	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R802	1M115	Resistor 0805 Surface Mount 0.125W 1% 150R
R803	1M115	Resistor 0805 Surface Mount 0.125W 1% 150R
R804	1M115	Resistor 0805 Surface Mount 0.125W 1% 150R
R805	1M115	Resistor 0805 Surface Mount 0.125W 1% 150R
R806	1M115	Resistor 0805 Surface Mount 0.125W 1% 150R
R807	1M116	Resistor 0805 Surface Mount 0.125W 1% 160R
R808	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R809	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R810	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R811	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R812	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R813	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R814	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R815	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R816	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R817	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R818	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R819	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R901	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R902	1M039	Resistor 0805 Surface Mount 0.125W 1% 39R
R903	1M043	Resistor 0805 Surface Mount 0.125W 1% 43R
R904	1M468	Resistor 0805 Surface Mount 0.125W 1% 680K
R905	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R906	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R907	1M256	Resistor 0805 Surface Mount 0.125W 1% 5K6
R908	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R909	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R910	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R911	1M522	Resistor 0805 Surface Mount 0.125W 1% 2M2
R912	1M330	Resistor 0805 Surface Mount 0.125W 1% 30K
R914	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R915	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R916	1M227	Resistor 0805 Surface Mount 0.125W 1% 2K7

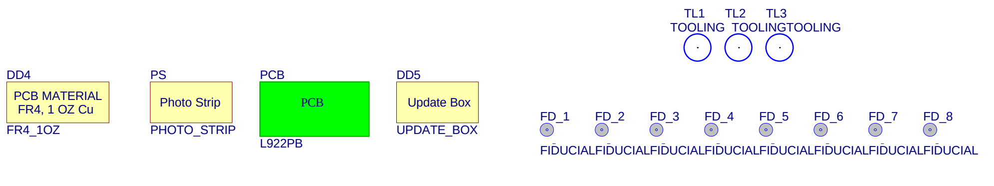
L922 Video Board Parts List Issue 3.2

Designator	Part	Description
R917	1M227	Resistor 0805 Surface Mount 0.125W 1% 2K7
R918	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R919	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R920	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R1000	1M139	Resistor 0805 Surface Mount 0.125W 1% 390R
R1001	1M212	Resistor 0805 Surface Mount 0.125W 1% 1K2
R1002	1C856	Resistor Carbon Film 2W 5% 5R6
SC1	E870MC	SHIELD EMC TOP-VIDEO PCB FMJ AV8
SC2	E869MC	SHIELD EMC VIDEO PCB FMJ AV8
SK200	8D221	PHONO SKT SINGLE GOLD
SK201	8D221	PHONO SKT SINGLE GOLD
SK202	8D221	PHONO SKT SINGLE GOLD
SK203	8D221	PHONO SKT SINGLE GOLD
SK204	8D221	PHONO SKT SINGLE GOLD
SK205	8D221	PHONO SKT SINGLE GOLD
SK206	8D221	PHONO SKT SINGLE GOLD
SK207	8D221	PHONO SKT SINGLE GOLD
SK208	8D221	PHONO SKT SINGLE GOLD
SK209	8K8022B	CON 1.00MM VERTICAL FFC 22WAY FMN SERIES
SK400	8D233	CON PCB JACK 3.5MM STEREO
SK401	8K9009M	CON DTYPE HORIZ 9WAY MALE WITH BOARDLOCK
SK402	8D304	SKT JACK DUAL 3.5MM STEREO
SK403	8D304	SKT JACK DUAL 3.5MM STEREO
SK404	8D233	CON PCB JACK 3.5MM STEREO
SK500	8D225	PHONO SKT 4-WAY GOLD
SK501	8D225	PHONO SKT 4-WAY GOLD
SK502	8D225	PHONO SKT 4-WAY GOLD
SK600	8D225	PHONO SKT 4-WAY GOLD
SK601	8D232	PHONO SKT 2 WAY VERT GOLD INDIVIDUAL GNDS
SK700	8K8022B	CON 1.00MM VERTICAL FFC 22WAY FMN SERIES
SK701	8D2272	CON SVHS MINI DIN UNSCREENED
SK702	8K8330	CON 1.00MM VERTICAL SM FFC 30WAY
SK800	8D2272	CON SVHS MINI DIN UNSCREENED
SK801	8D2272	CON SVHS MINI DIN UNSCREENED
SK802	8D2272	CON SVHS MINI DIN UNSCREENED
SK803	8D2272	CON SVHS MINI DIN UNSCREENED
SK804	8D2272	CON SVHS MINI DIN UNSCREENED
SK805	8D2272	CON SVHS MINI DIN UNSCREENED
SK1000	8K2408	CON CT SERIES VERTICAL 8WAY
SKP1	8K2005	CON CT SERIES VERTICAL 5WAY
SKP2	8D301	CON PCB STEREO JACK
SW402	A1501	SWITCH TACT SDT SERIES
X300	7X022	Crystal 17.73447MHz low profile HC49
X301	7X020	Crystal 14.31818MHz low profile HC49

L922 AV8 Video Circuit

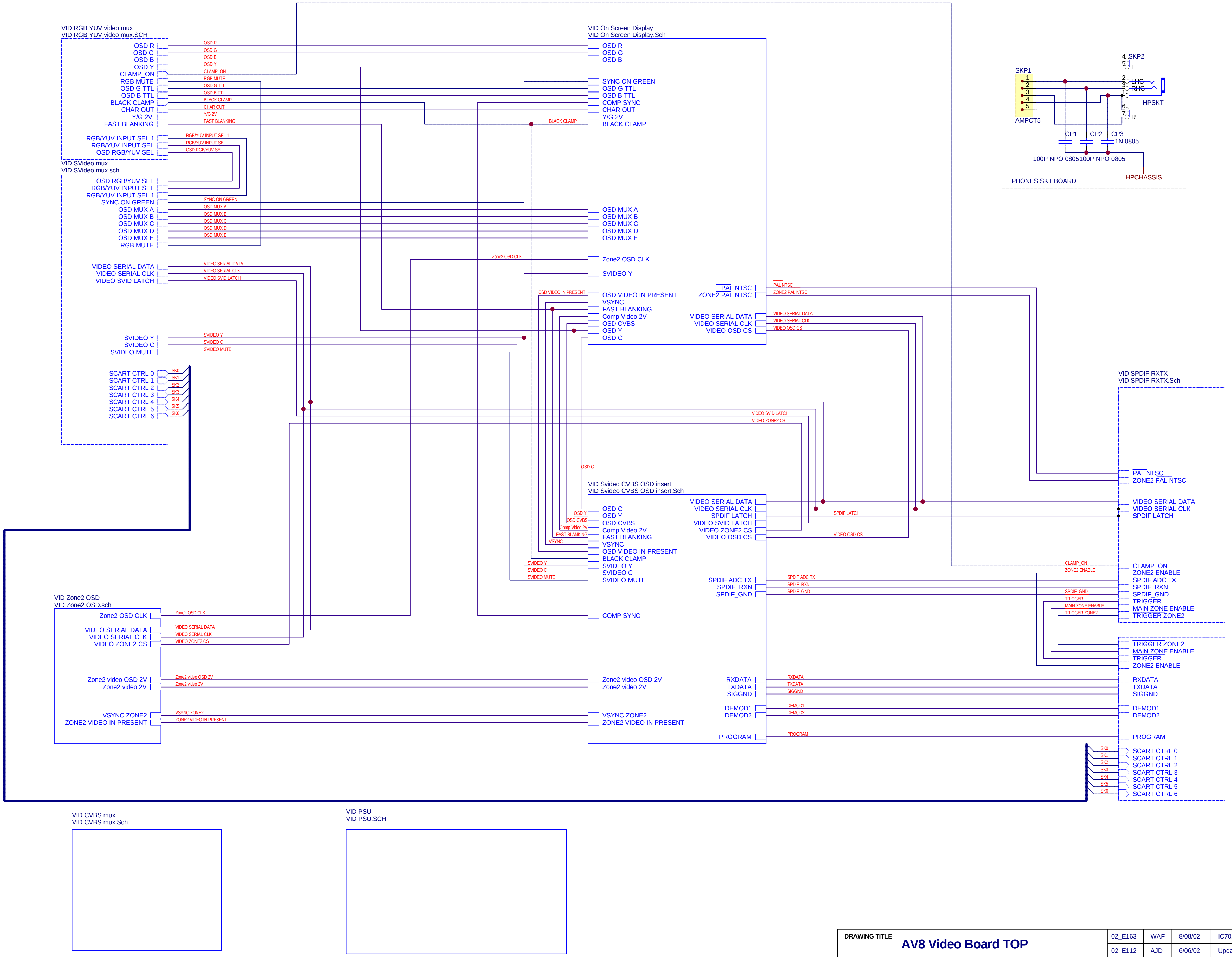




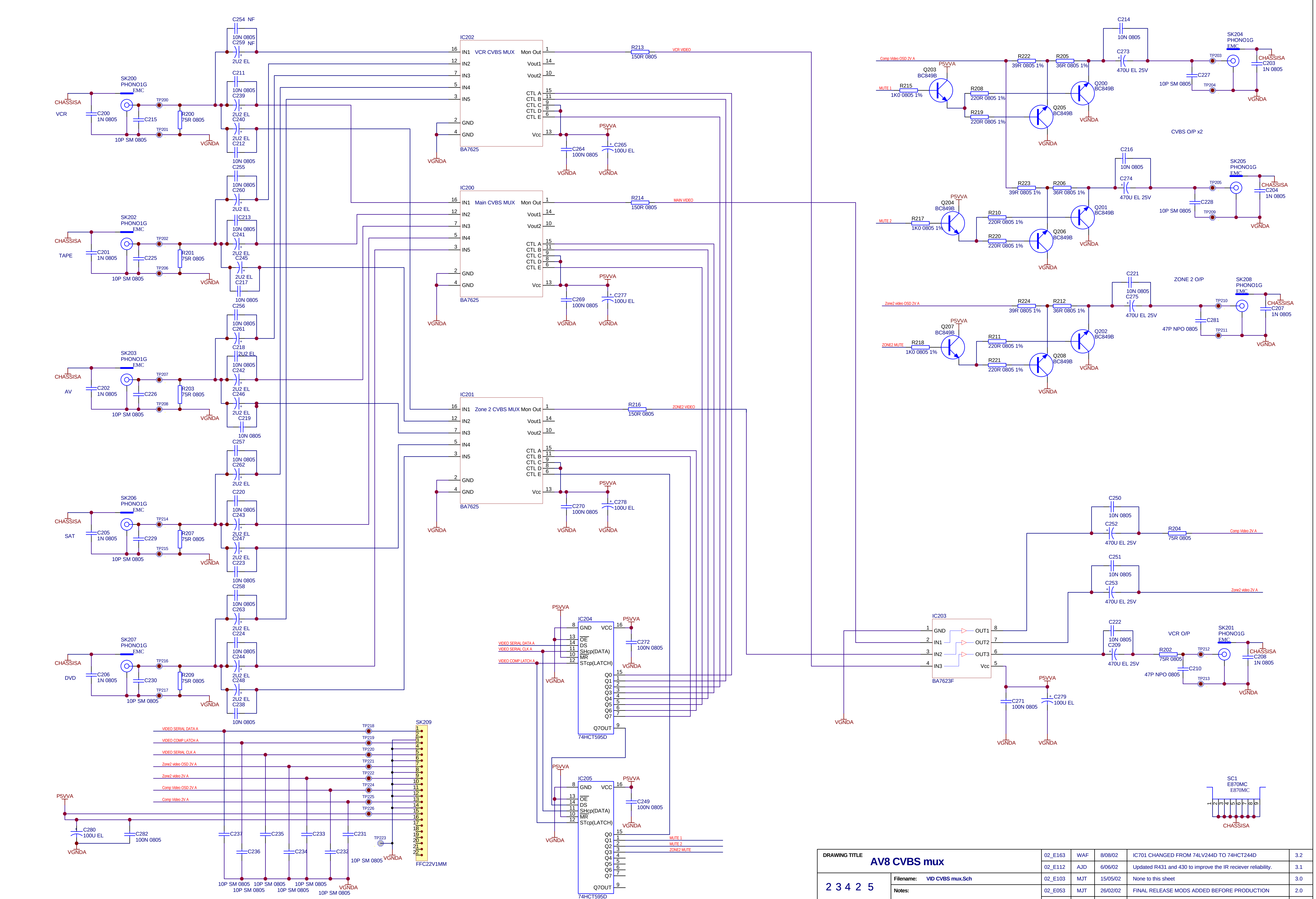


DRAWING TITLE	AV8 Video PCB Icons + Mech parts	02_E163	WAF	8/08/02	IC701 CHANGED FROM 74LV244D TO 74HCT244D	3.2
		02_E112	AJD	6/06/02	Updated R431 and 430 to improve the IR reciever reliability.	3.1.0
2 3 4 2 5	Filename: L922CT_3.2.Sch	02_E103	MJT	15/05/02	Mods to pass THX (video levels, clocks, black clamp) and board outline. Sch symbol for 3.5mm jack (scart ctrl) corrected and connections swapped.	3.0
	Notes:	02_E053	MJT	26/02/02	FINAL RELEASE MODS ADDED BEFORE PRODUCTION	2.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB		02_E029	WAF	31/1/02	PRODUCTION ISSUE FOR ATE	1.0
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
	Contact Engineer: Andrew Dutton	Contact Tel: (01223) 203200	Printed: 8-Aug-2002		Sheet 1 of 11	DRAWING NO. L922CT

L922 AV8 Video Circuit



DRAWING TITLE **AV8 Video Board TOP**		02_E163	WAF	8/08/02	IC701 CHANGED FROM 74LV244D TO 74HCT244D	3.2
		02_E112	AJD	6/06/02	Updated R431 and 430 to improve the IR reciever reliability.	
2 3 4 2 5	Filename: VID TOP.Sch	02_E103	MJT	15/05/02	None to this sheet	3.0
	Notes:	02_E053	MJT	26/02/02	FINAL RELEASE MODS ADDED BEFORE PRODUCTION	2.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB		02_E029	WAF	31/1/02	PRODUCTION ISSUE FOR ATE	1.0
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
	Contact Engineer: Andrew Dutton	Contact Tel: (01223) 203200	Printed: 8-Aug-2002	Sheet 2 of 11	DRAWING NO.	L922CT



DRAWING TITLE AV8 CVBS mux

2 3 4 2 5

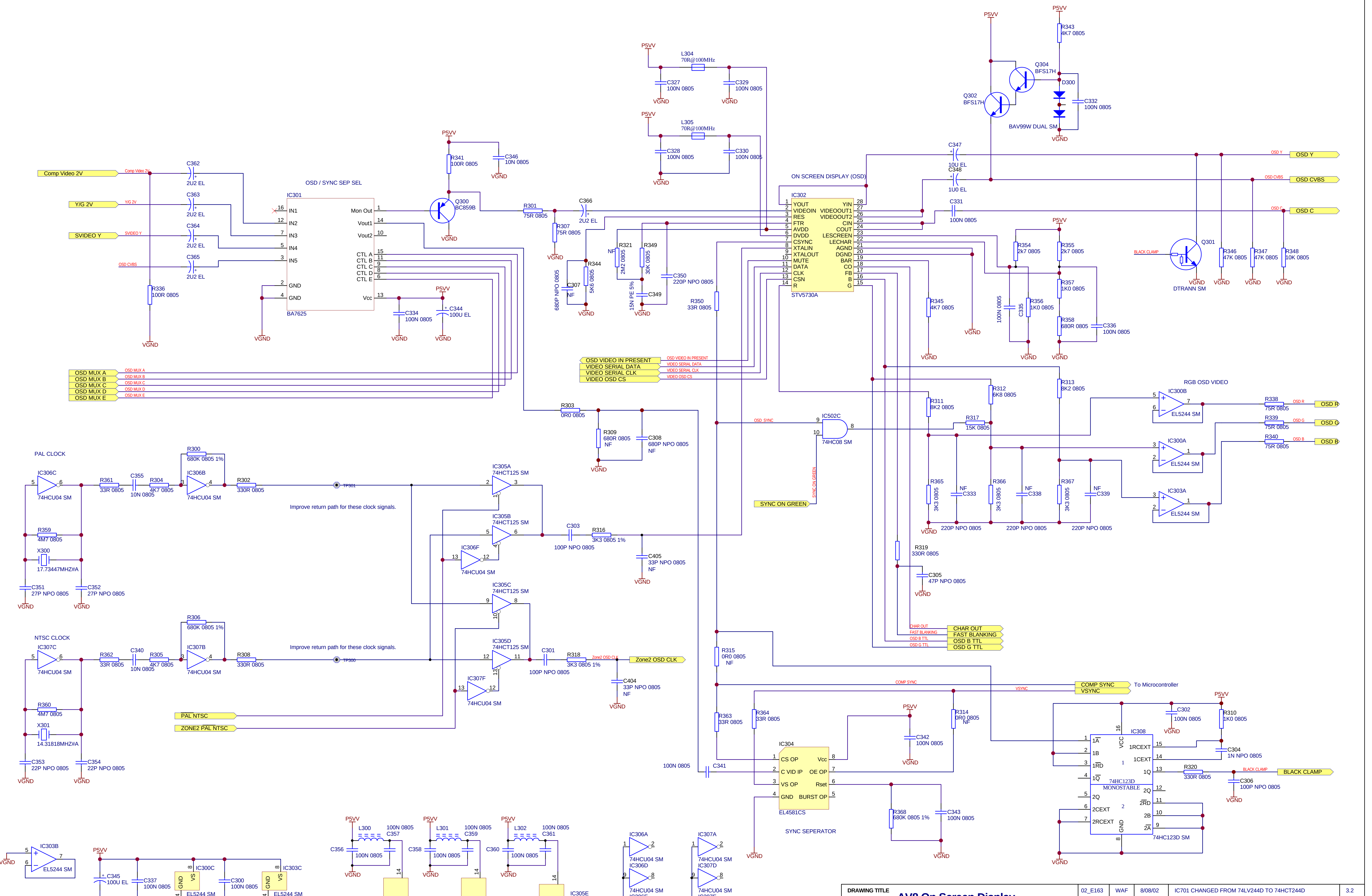
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Notes:

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ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
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02_E112	AJD	6/06/02	Updated R431 and 430 to improve the IR reciever reliability.	3.1
02_E103	MJT	15/05/02	None to this sheet	3.0
02_E053	MJT	26/02/02	FINAL RELEASE MODS ADDED BEFORE PRODUCTION	2.0
02_E029	WAF	31/1/02	PRODUCTION ISSUE FOR ATE	1.0

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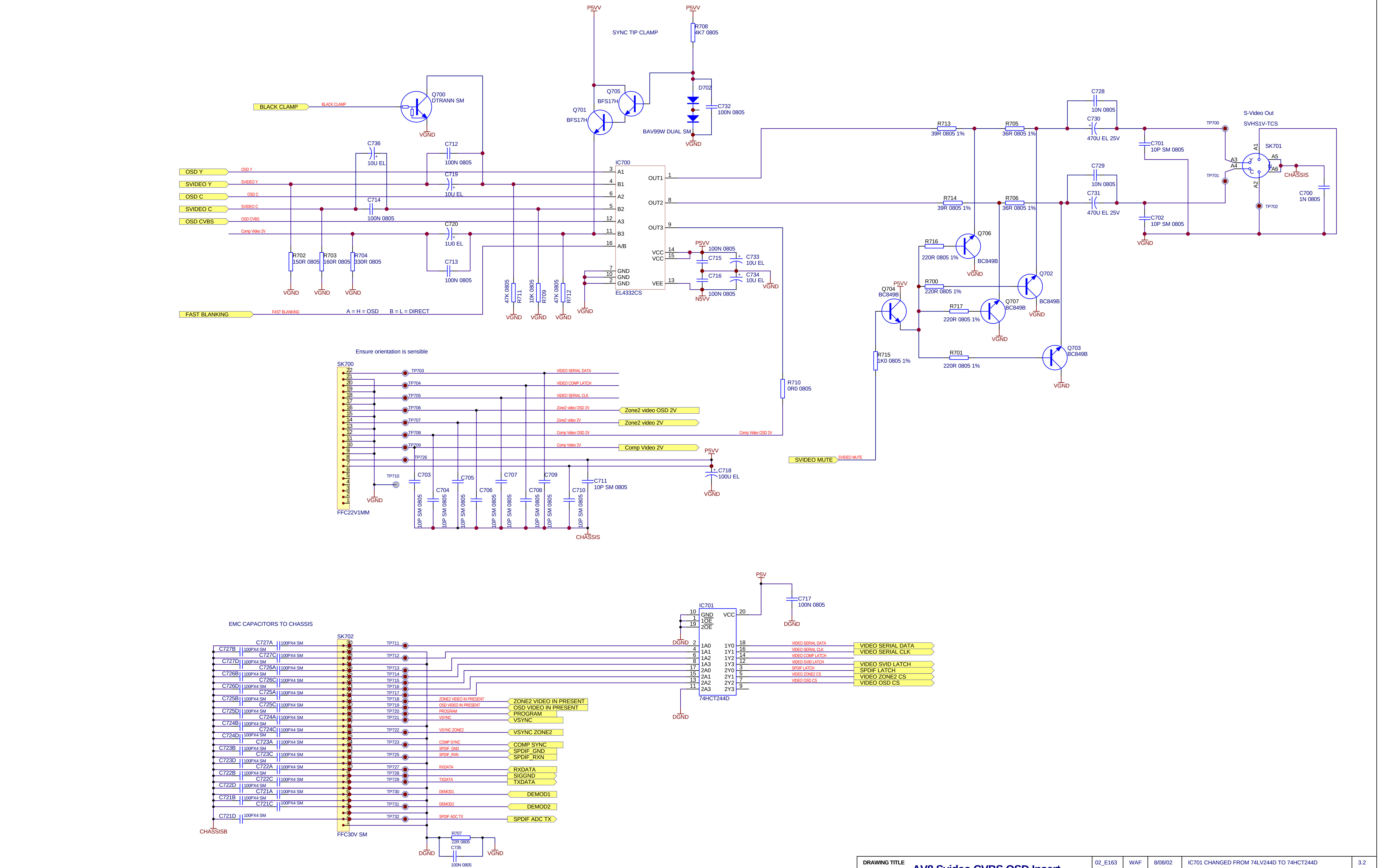


DRAWING TITLE **AV8 On Screen Display**	02_E163	WAF	8/08/02	IC701 CHANGED FROM 74LV244D TO 74HCT244D	3.2
	02_E112	AJD	6/06/02	Updated R431 and 430 to improve the IR reciever reliability.	3.1
Filename: VID On Screen Display.Sch	02_E103	MJT	15/05/02	R302,R308 now 330R (was 3k3). C348 now 1u (was 10u). C404,C405 now NF. C305 now 47p (was 10p). R310 now 1k (was 330R). C304 now 1N (was 100p).	3.0
Notes:	02_E053	MJT	26/02/02	FINAL RELEASE MODS ADDED BEFORE PRODUCTION	2.0
	02_E029	WAF	31/1/02	PRODUCTION ISSUE FOR ATE	1.0
	ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE

2 3 4 2 5

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DRAWING TITLE

AV8 Svideo CVBS OSD Insert

ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
02_E163	WAF	8/08/02	IC701 CHANGED FROM 74LV244D TO 74HCT244D	3.2
02_E112	AJD	6/06/02	Updated R431 and 430 to improve the IR reciever reliability.	3.1
02_E103	MJT	15/05/02	R702 now 150R (was 75R). R703 now 160R (was 75R).	3.0
02_E053	MJT	26/02/02	FINAL RELEASE MODS ADDED BEFORE PRODUCTION	2.0
02_E029	WAF	31/1/02	PRODUCTION ISSUE FOR ATE	1.0

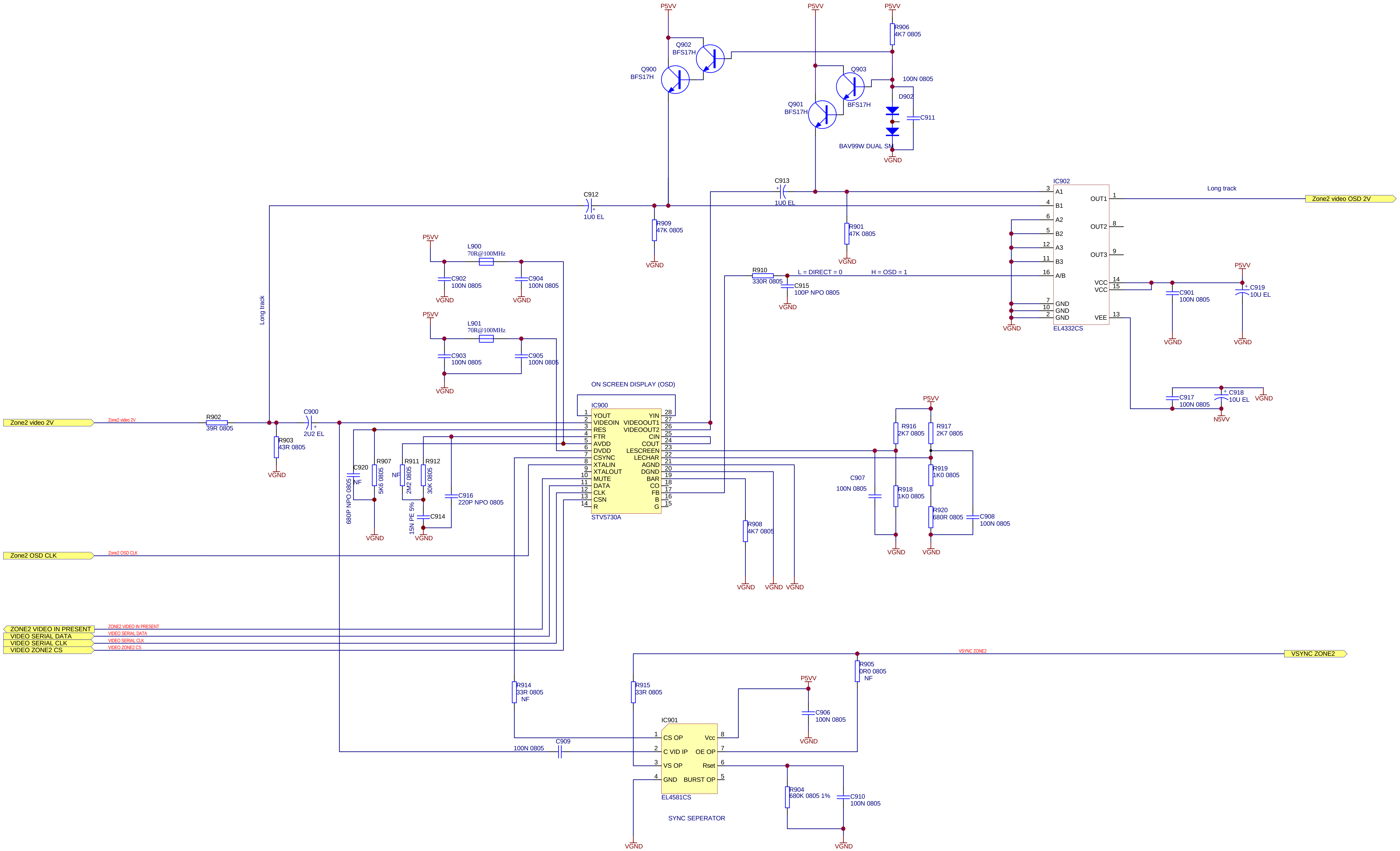
Filename: VID Svideo CVBS OSD insert.Sch

Notes:

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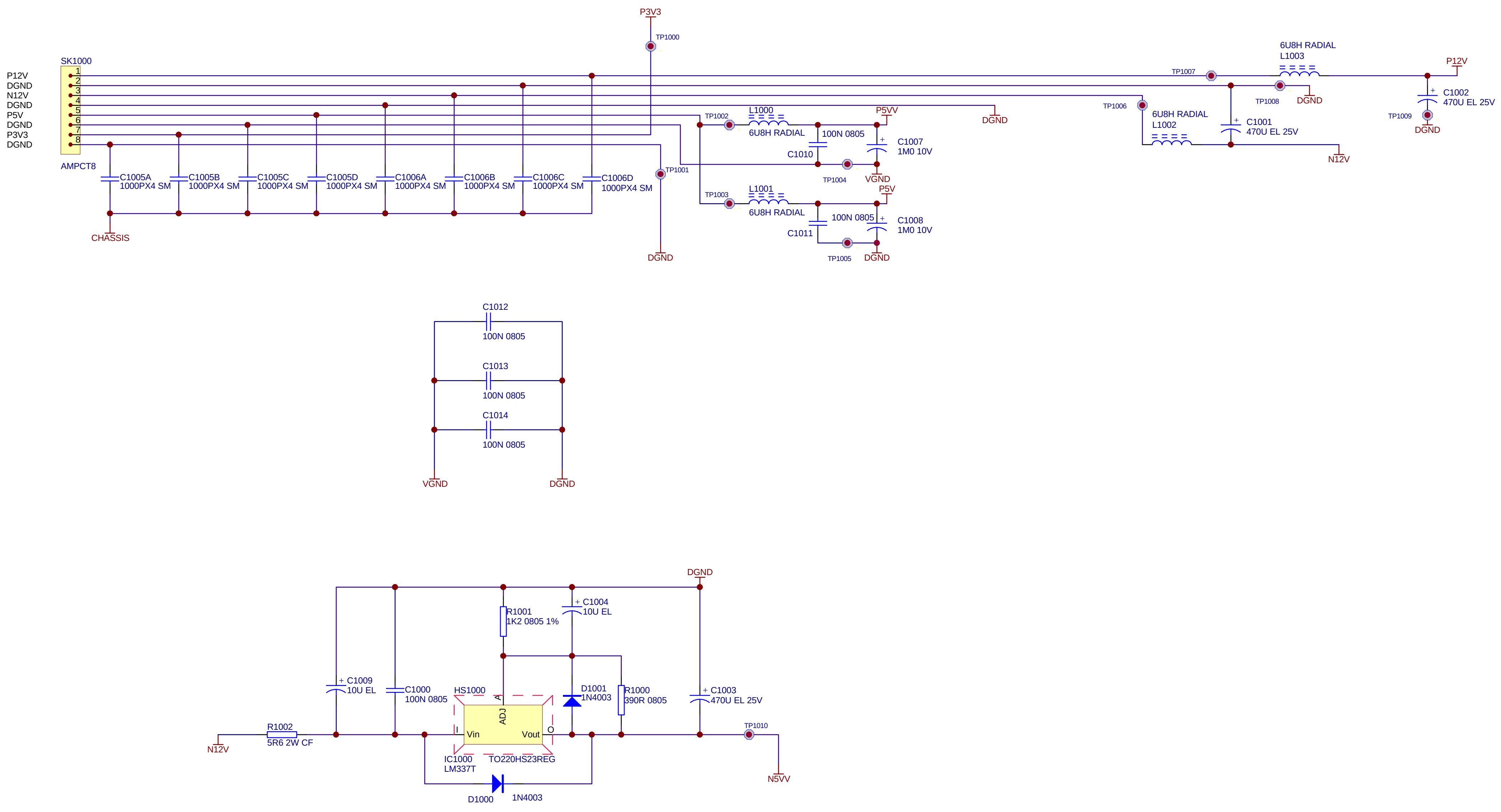
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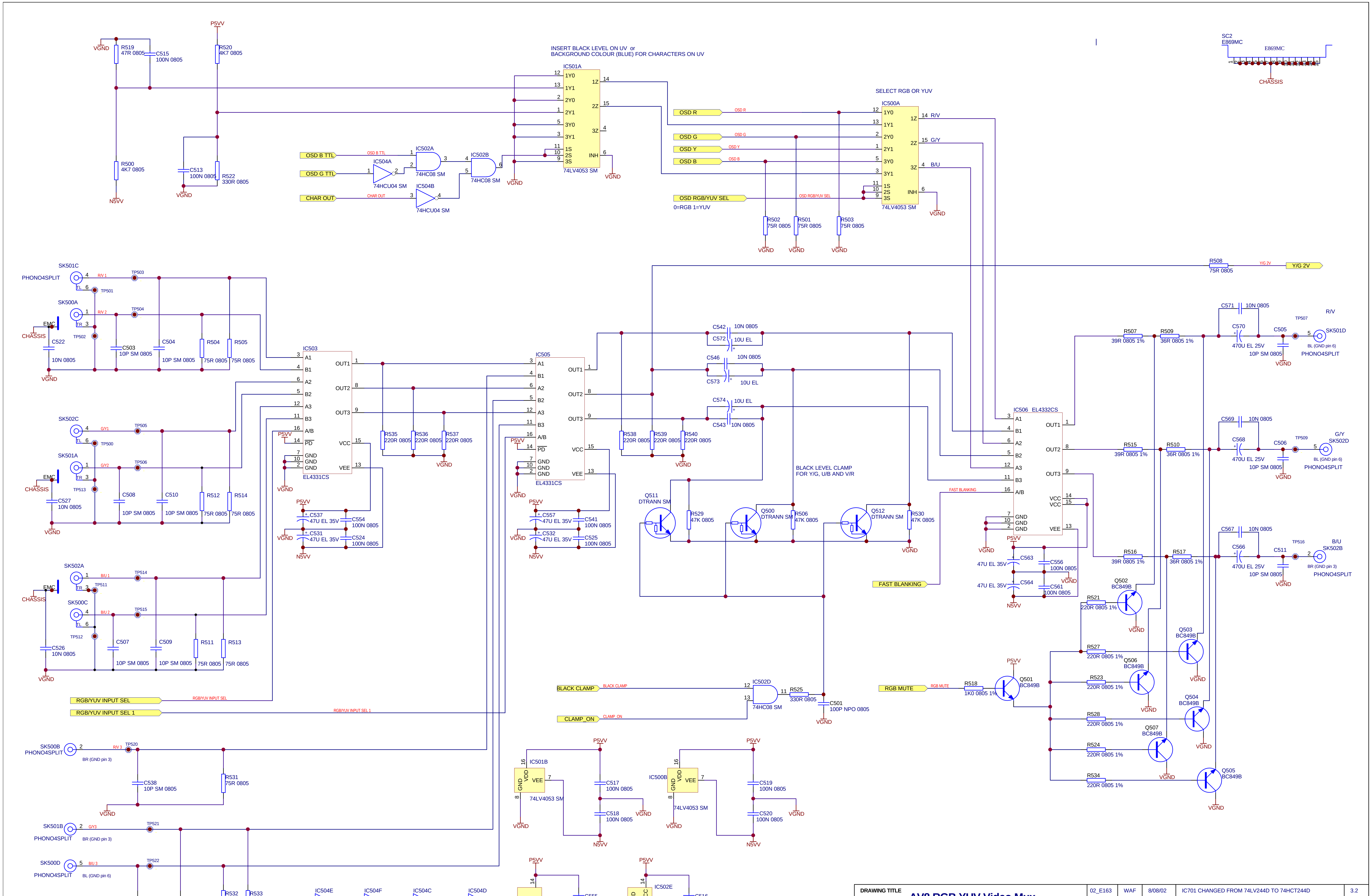


DRAWING TITLE **AV8 Zone2 OSD**		02_E163	WAF	8/08/02	IC701 CHANGED FROM 74LV244D TO 74HCT244D	3.2
		02_E112	AJD	6/06/02	Updated R431 and 430 to improve the IR reciever reliability.	3.1
2 3 4 2 5	Filename: VID Zone2 OSD.sch	02_E103	MJT	15/05/02	R902 now 39R (was 75R). R903 now 43R (was 75R). C912, C913 now 1u (was 10u).	3.0
	Notes:	02_E053	MJT	26/02/02	FINAL RELEASE MODS ADDED BEFORE PRODUCTION	2.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB		02_E029	WAF	31/1/02	PRODUCTION ISSUE FOR ATE	1.0
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE

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DRAWING TITLE **AV8 Power Supply**		02_E163	WAF	8/08/02	IC701 CHANGED FROM 74LV244D TO 74HCT244D	3.2
		02_E112	AJD	6/06/02	Updated R431 and 430 to improve the IR reciever reliability.	3.1
2 3 4 2 5	Filename: VID PSU.Sch	02_E103	MJT	15/05/02	None to this sheet	3.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB	Notes:	02_E053	MJT	26/02/02	FINAL RELEASE MODS ADDED BEFORE PRODUCTION	2.0
		02_E029	WAF	31/1/02	PRODUCTION ISSUE FOR ATE	1.0
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
	Contact Engineer: Andrew Dutton	Contact Tel: (01223) 203200	Printed: 8-Aug-2002		Sheet 11 of 11	DRAWING NO. L922CT



DRAWING TITLE: AV8 RGB YUV Video Mux

23425

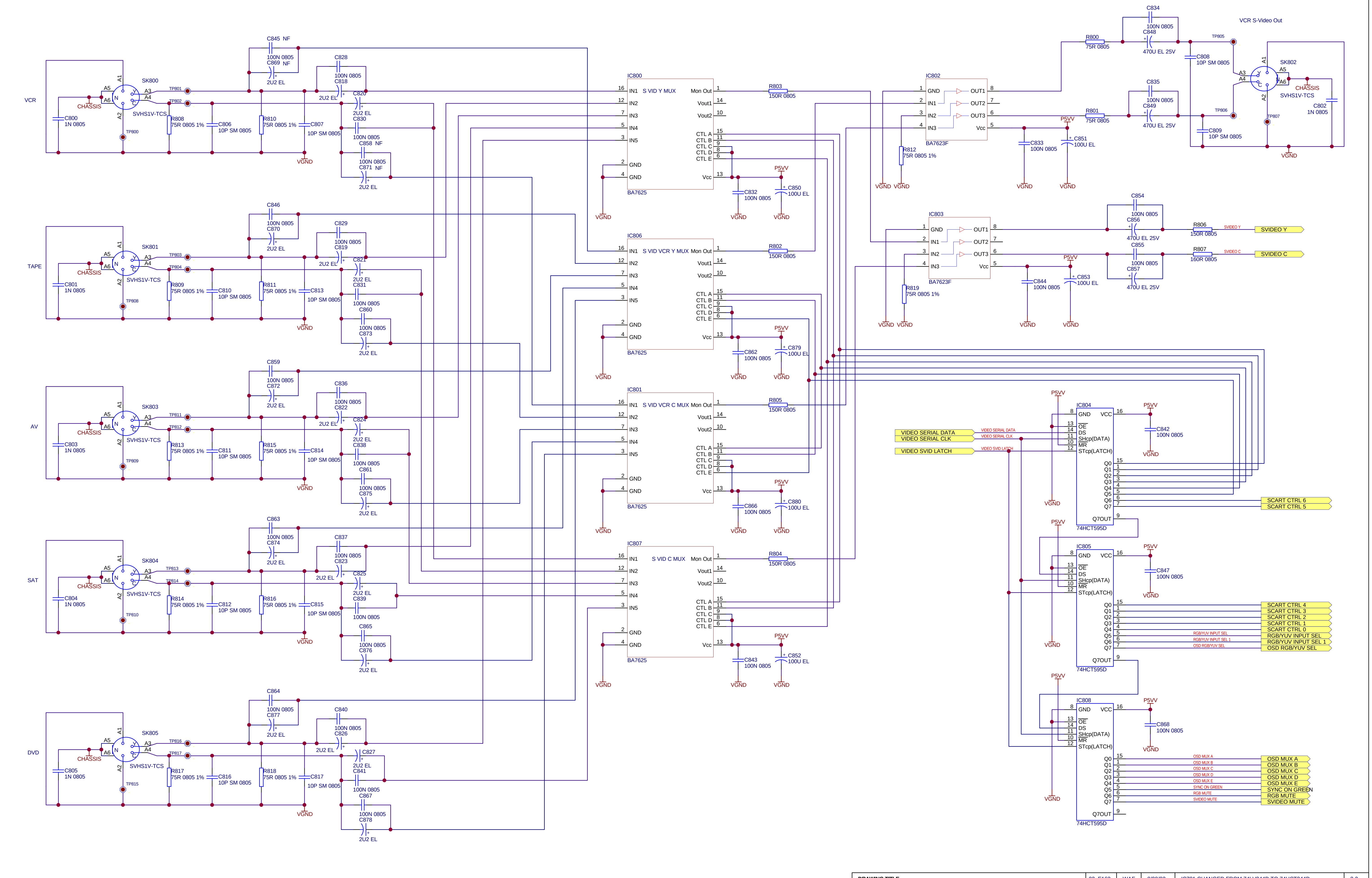
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Cambridge CB5 9PB

Filename: VID RGB YUV video mux.SCH

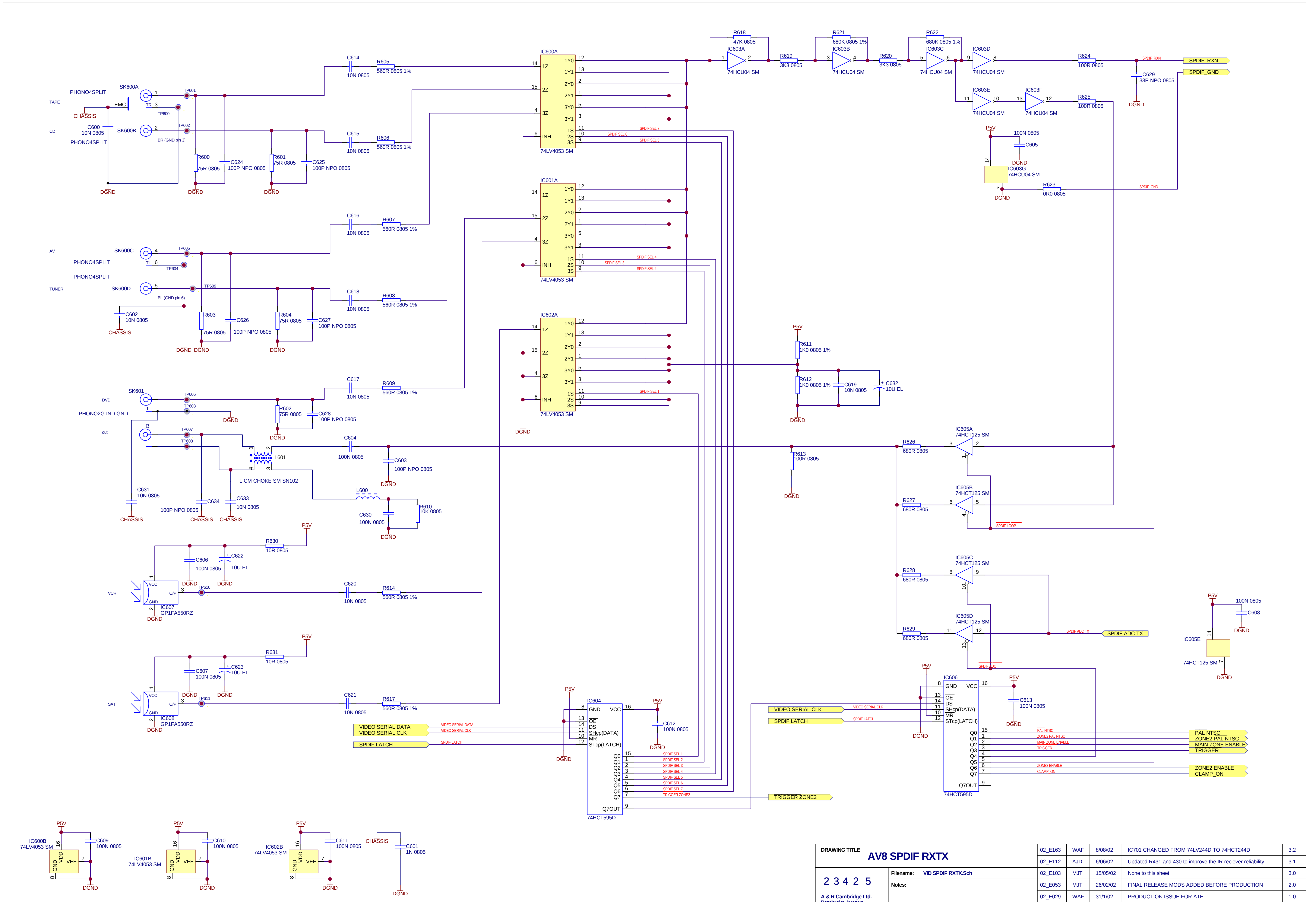
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ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
02_E163	WAF	8/08/02	IC701 CHANGED FROM 74LV244D TO 74HCT244D	3.2
02_E112	AJD	6/06/02	Updated R431 and 430 to improve the IR reciever reliability.	3.1
02_E103	MJT	15/05/02	None to this sheet	3.0
02_E053	MJT	26/02/02	FINAL RELEASE MODS ADDED BEFORE PRODUCTION	2.0
02_E029	WAF	31/1/02	PRODUCTION ISSUE FOR ATE	1.0

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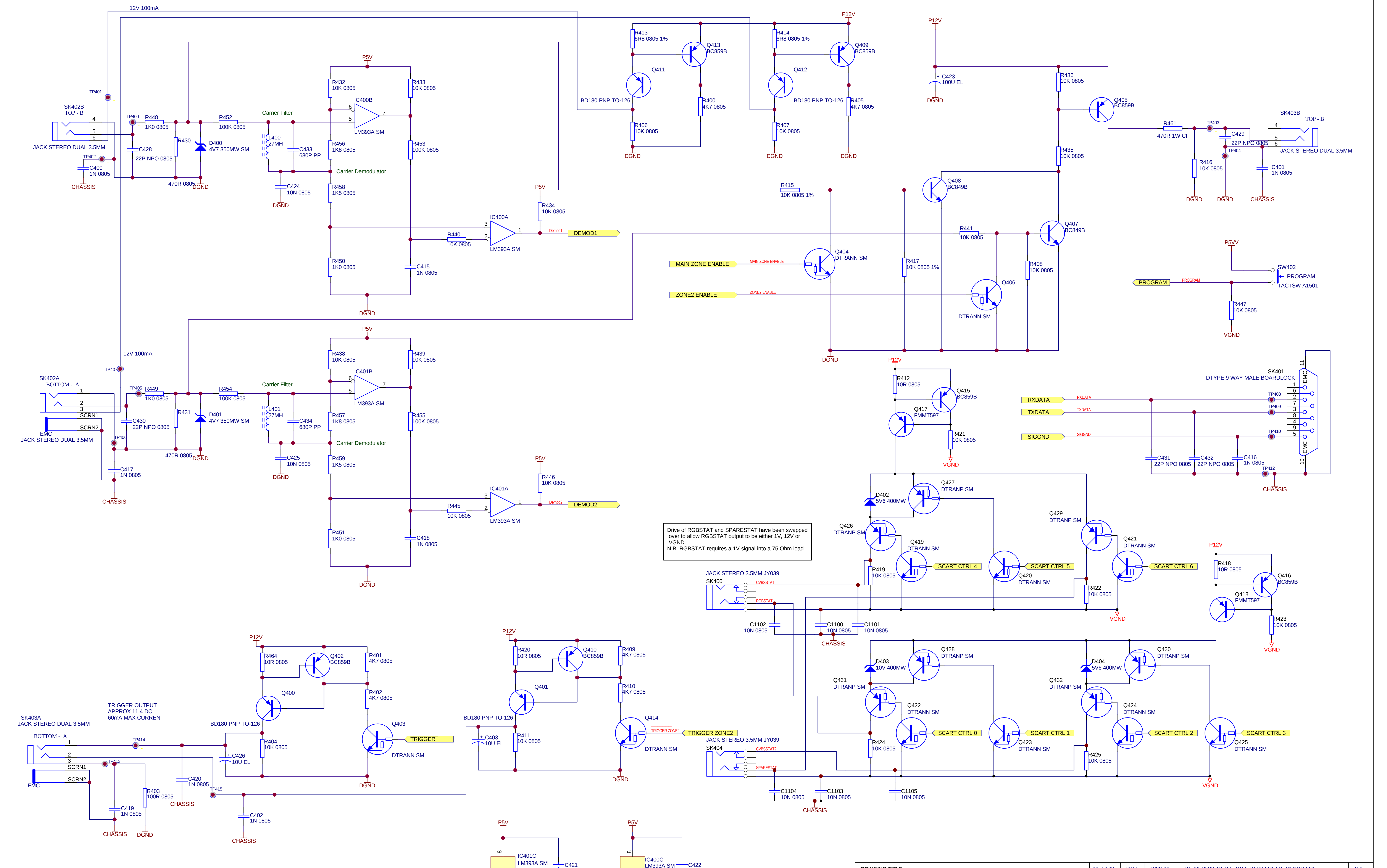
DRAWING TITLE **AV8 SVideo Mux**		02_E163	WAF	8/08/02	IC701 CHANGED FROM 74LV244D TO 74HCT244D	3.2
		02_E112	AJD	6/06/02	Updated R431 and 430 to improve the IR reciever reliability.	3.1
2 3 4 2 5	Filename: VID SVideo mux.sch	02_E103	MJT	15/05/02	R806 now 150R (was 75R). R807 now 160R (was 75R).	3.0
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB	Notes:	02_E053	MJT	26/02/02	FINAL RELEASE MODS ADDED BEFORE PRODUCTION	2.0
		02_E029	WAF	31/1/02	PRODUCTION ISSUE FOR ATE	1.0
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
	Contact Engineer: Andrew Dutton	Contact Tel: (01223) 203200	Printed: 8-Aug-2002	Sheet 9 of 11	DRAWING NO. L922CT	



DRAWING TITLE **AV8 SPDIF RXTX**		02_E163	WAF	8/08/02	IC701 CHANGED FROM 74LV244D TO 74HCT244D	3.2
		02_E112	AJD	6/06/02	Updated R431 and 430 to improve the IR reciever reliability.	3.1
2 3 4 2 5	Filename: VID SPDIF RXTX.Sch	02_E103	MJT	15/05/02	None to this sheet	3.0
	Notes:	02_E053	MJT	26/02/02	FINAL RELEASE MODS ADDED BEFORE PRODUCTION	2.0
		02_E029	WAF	31/1/02	PRODUCTION ISSUE FOR ATE	1.0
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE

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DRAWING TITLE **AV8 RC5 Trigger**		02_E163	WAF	8/08/02	IC701 CHANGED FROM 74LV244D TO 74HCT244D	3.2
		02_E112	AJD	6/06/02	Updated R431 and 430 to improve the IR reciever reliability.	3.1
2 3 4 2 5	Filename: VID RC5 & TRIGGER.sch	02_E103	MJT	15/05/02	Corrected JY039 socket schematic symbol, changed schematic to keep PCB the same.	3.0
	Notes:	02_E053	MJT	26/02/02	FINAL RELEASE MODS ADDED BEFORE PRODUCTION	2.0
		02_E029	WAF	31/1/02	PRODUCTION ISSUE FOR ATE	1.0
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE

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Contact Tel: (01223) 203200

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DRAWING NO. L922CT

Phase Locked Loop Board L948

Contents

- Circuit description
- Component overlay
- Parts list
- Circuit diagrams

AV8 Phase Locked Loop Board

Introduction
Refer To Block Diagram

The phase locked loop performs a comparison between the incoming master clock from the crystal semiconductors SPDIF receiver chip CS8415A and a locally derived master clock from an xtal based Voltage controlled oscillator (VCXO).

The comparison is made at Fs (44.1 or 48 KHz) rather than the master clock frequency (256xFs) as this improves the low frequency noise rejection of the circuit. The micro controller on the main digital PCB (L896) knows what the incoming frequency is and can select the appropriate Xtal oscillator using the control lines XTAL11.2896 and XTAL 12.288.

The phase comparison is used to dump or source current from an integrating circuit which filters the pulses and converts the charge to a voltage to control the VCXO.

When charge is dumped onto the integrator the voltage decreases (as it inverts) and this in turn reduces the reverse bias across the voltage control capacitor (Varicap). Reducing the reverse bias makes the depletion region in the diode become smaller increasing the capacitance.

Increasing the capacitance increases the load capacitance on the xtal oscillator and thus reduces the frequency at which the crystal oscillates. (The circuit works in the opposite manner if charge is sourced off of the integrator) This is the method by which frequency lock is achieved. The phase of the circuit is arbitrary as it uses two dividers that generate the Fs signals.

The bypass circuit feeds the clock from the CS8415A direct to the rest of the circuits in the event of any of the following conditions.

- ❑ Phase locked loop cannot lock to the incoming signal (i.e. it is not at Fs = 44.1 or 48KHz)
- ❑ To much jitter on the signal that it goes outside the +/- 150PPM tolerance
- ❑ When the loop is actively locking onto signal

In the event that the circuit is knocked out of lock for any reason more than three times after the DSPs on the main board have been reset it defaults to staying in bypass. This is to prevent the situation where the master clock is repeatedly lost.

Description
Refer to circuit diagram L948 sheet 1

The master clock from the digital PCB L896 comes in on pin 2 of SK3 goes to both the divider IC1 and to the bypass circuit IC6. The divider divides by 256 and the clock at Fs then goes to the Comp input of the Phase comparator IC4.

As the integrator inverts the polarity of the control voltage the inputs on the Phase comparator are swapped over so that the comparison input is used for the main signal and the signal input is used for the comparison input. This corrects the polarity of the complete control loop.

The sig input on the phase comparator is fed from the second divider IC2. IC2 divides the output of the voltage controlled xtal oscillator by 256 so that it is also at Fs.

The phase comparator output PC2 generates a charge pulse if the two signals are not exactly in phase and this pulse is filtered and integrated by the opamp circuit IC5. IC5 runs from +/- 12V rails so that the control voltage range can be increased from 5V at the output of the phase comparator to approximately 20V (+/- 10v) at the output of the opamp. The increase voltage range allows a much greater capacitance range to be achieved on the varicaps D1 and D2. IC5 pin 3 is biased to 2.5 volts so that the 0 to 5V input range can be converted to a positive and negative output voltage.

IC5 Loop filter.
0V on the input = 10V on the output and 5V on the input = -10V on the output

The DC control voltage from the output of IC5 pin 6 is fed to the input of the varicaps D1 and D2. C31 and C35 provide an AC ground for the oscillator circuit. R10,R11,C33,C40 and R12,R13,C38,C41 create a filtered negative 12V bias for the diode so that a maximum voltage of 22V (12V +10V) from opamp and a minimum of 2V (12V –10V) can be present on the varicap.

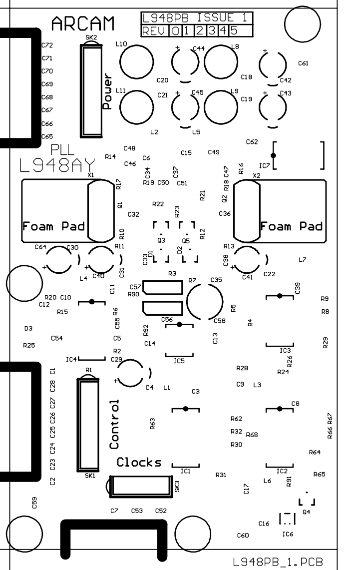
The oscillator is a collpits type, the gain is provided by the RF transistor Q1 and Q2. The oscillator can be turned on and off by the digital transistors Q3 and Q5 this removes the load from the emitter of the RF transistors. The output of the oscillator is via the capacitors C50 and C51 after the capacitors the signal is biased to the threshold point of the following gates IC3A and IC3C. The gates amplify the signal then the signal is fed back to the input of the loop to the divider IC IC2 and to the input of a second buffer. The second buffer is so that the micro can switch between the original clock and the phase locked clock buffer. This is achieved by IC3B and IC3D and the output (phase locked or bypass) is fed back to the main digital PCB L896.

Q4 in the bypass feed is used to mute the input to IC3D when the circuit is phased locked. This is to reduce any cross talk from the original input master clock and the de-jittered phase locked master clock.

Lock detection is performed using the PC1/PCP out (PIN2) of IC4 the phase comparator. This signal goes low whenever there is any phase error between the two incoming signals so it can be used to determine if the signal is in lock. When the signal is in lock this is always high or has very small variations only due to tiny phase error corrections. If the signals go out of lock the signal goes low and the capacitor C12 is discharged fast via the diode D3, to charge the cap up again the signal has to pass through the resistor R15 so the circuit is biased towards indication out of lock very quickly and only showing lock when the signal has been high for some time. As the output of the PCP is a 5V signal and the Schmitt trigger IC7 is a 3.3V part a potential divider is used to reduce this voltage to a maximum of 2.5V by R15 and R25. The Schmitt trigger cleans up the edge of this lock detection signal and buffers it to be fed back to the micro controller.

When the micro detects a lock signal it waits a further 3 seconds to make sure the lock is stable then checks the lock signal again before switching from the bypass circuit to the phase locked clock.

Specification	**Range**
Lock range 44.1 KHz	11.2896 MHz +/- 150PPM
Lock range 48 KHz	12.288MHz +/- 150PPM



ARCAM
L948PB ISSUE 1
REV 0 1 2 3 4 5
Power
PLL
L948AY
Foam Pad
Foam Pad
Control
Clocks
L948PB_1.PCB

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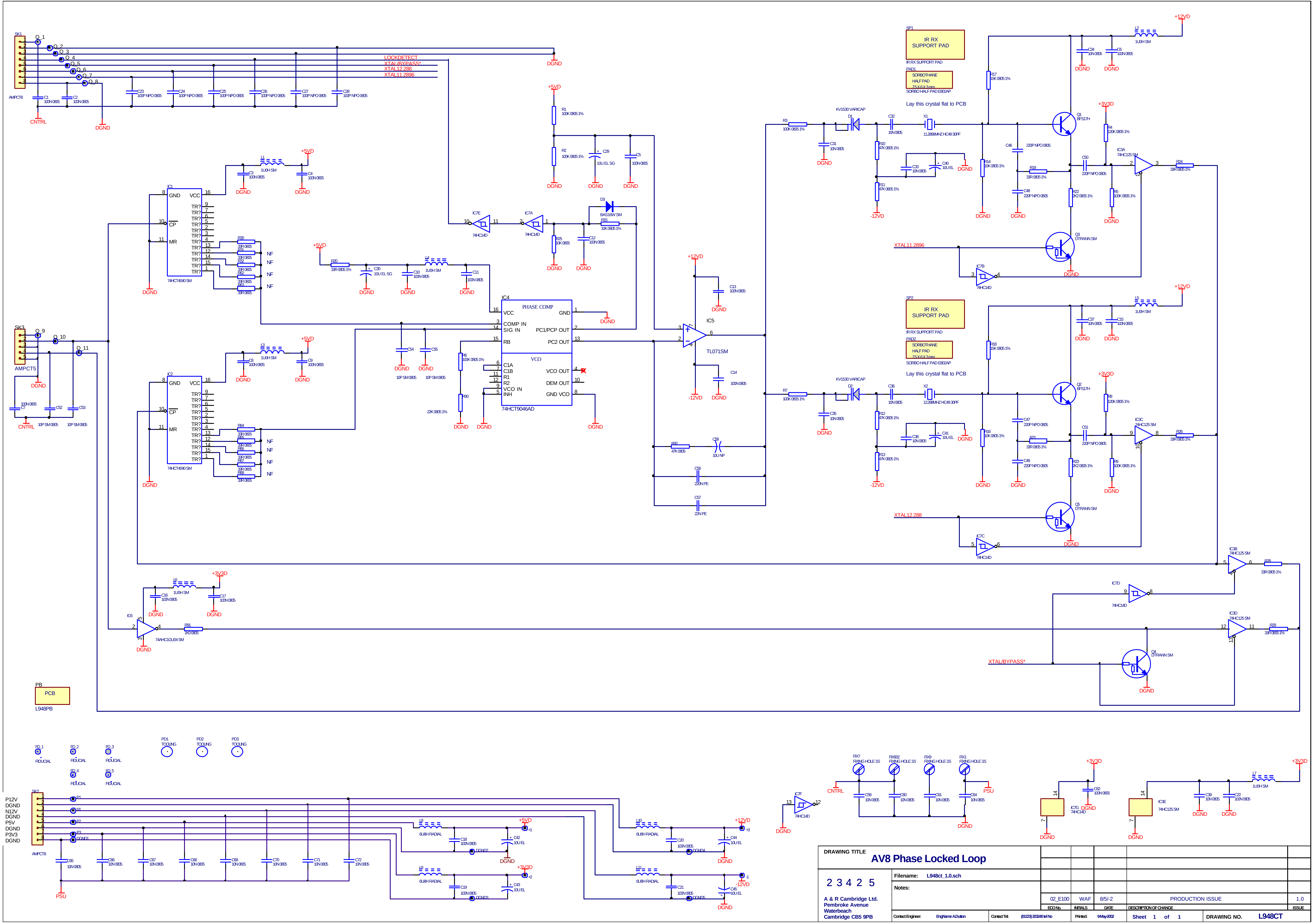
Designator	Part	Description
C1	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C2	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C3	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C4	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C5	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C6	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C7	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C8	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C9	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C10	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C11	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C12	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C13	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C14	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C15	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C16	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C17	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C18	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C19	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C20	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C21	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C22	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C23	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C24	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C25	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C26	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C27	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C28	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C29	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C30	2P610	Capacitor Radial Electrolytic ELNA ROD 10UF 35V
C31	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C32	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C33	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C34	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C35	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C36	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C37	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C38	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C39	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C40	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C41	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C42	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C43	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C44	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C45	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C46	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C47	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C48	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C49	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C50	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C51	2L122	Capacitor SM 0805 NPO Ceramic 5% 100V 220P
C52	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C53	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C54	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C55	2L010	Capacitor SM 0805 NPO Ceramic 5% 100V 10P
C56	2KA422	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 220N
C57	2KA322	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 22N
C58	2U610	Capacitor Non-Polar Radial Electrolytic 10UF 63V
C59	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C60	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C61	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C62	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N

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Designator	Part	Description
C64	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C65	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C66	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C67	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C68	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C69	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C70	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C71	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
C72	2J310	Capacitor SM 0805 X7R Ceramic 10% 50V 10N
D1	3E1530	Diode VARICAP KV1530
D2	3E1530	Diode VARICAP KV1530
D3	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
IC1	5K4040	IC 12-STAGE BINARY RIPPLE COUNTER74HCT4040D SMT
IC2	5K4040	IC 12-STAGE BINARY RIPPLE COUNTER74HCT4040D SMT
IC3	5K74125	IC QUAD BUFFER 74HC125D SMT
IC4	5F9046AD	IC PLL 74HCT9046AD SMT
IC5	5B071CD	Opamp TL071CN SO-8 Package
IC6	5KA1U04	IC SINGLE INVERTER SN74AHC1GU04DBVR DBV
IC7	5K7414	IC HEX INVERTING SCHMITT TRIGGER 74HC14 SMT
L1	7B810	Inductor Surface Mount 1U0
L2	7B810	Inductor Surface Mount 1U0
L3	7B810	Inductor Surface Mount 1U0
L4	7B810	Inductor Surface Mount 1U0
L5	7B810	Inductor Surface Mount 1U0
L6	7B810	Inductor Surface Mount 1U0
L7	7B810	Inductor Surface Mount 1U0
L8	7D968A	Inductor 6U8
L9	7D968A	Inductor 6U8
L10	7D968A	Inductor 6U8
L11	7D968A	Inductor 6U8
PAD1	E802AP	PAD DAMPING 15x6x3MM SORBOTHANE
PAD2	E802AP	PAD DAMPING 15x6x3MM SORBOTHANE
PB	L948PB	BLANK PCB AV8 PHASE LOCKED LOOP PCB
Q1	4D17H	Transistor BFS17H SOT23 Package
Q2	4D17H	Transistor BFS17H SOT23 Package
Q3	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q4	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
Q5	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package, 2x 10k resistors
R1	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R2	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R3	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R4	1M412	Resistor 0805 Surface Mount 0.125W 1% 120K
R5	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R6	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R7	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R8	1M412	Resistor 0805 Surface Mount 0.125W 1% 120K
R9	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R10	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R11	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R12	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R13	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R14	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R15	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R16	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R17	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R18	1M315	Resistor 0805 Surface Mount 0.125W 1% 15K
R19	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R20	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R21	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R22	1M222	Resistor 0805 Surface Mount 0.125W 1% 2K2
R23	1M222	Resistor 0805 Surface Mount 0.125W 1% 2K2
R24	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R

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Designator	Part	Description
R25	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R26	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R28	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R29	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R30	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R31	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R32	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R62	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R63	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R64	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R65	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R66	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R67	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R68	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R90	1M322	Resistor 0805 Surface Mount 0.125W 1% 22K
R91	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R92	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
SK1	8K2408	CON CT SERIES VERTICAL 8WAY
SK2	8K2408	CON CT SERIES VERTICAL 8WAY
SK3	8K2005	CON CT SERIES VERTICAL 5WAY
SP1	E822AP	PAD ADHESIVE SPACING - DIVA REMOTE SENSOR
SP2	E822AP	PAD ADHESIVE SPACING - DIVA REMOTE SENSOR
X1	7X042	Crystal 11.2896MHz GOLLEDGE 7X042
X2	7X043	Crystal 12.288 MHz


DRAWING TITLE
AV8 Phase Locked Loop
2 3 4 2 5
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Notes:
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Pembroke Avenue
Waterbeach
Cambridge CB5 9PB
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Contact Engineer: EngName ADutton
Contact Tel: (01223) 203240 tel No
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Sheet 1 of 1
DRAWING NO. L948CT

Mechanical Assembly

Contents

- General assembly parts list
- Phono card upgrade assembly parts list

AV8 General Assembly Parts List

ITEM	230V	115V	100V	SILVER	BLACK	DESCRIPTION	WHERE USED	QTY
1				E101AY	E101AYB	COVER PLATE ASSEMBLY		1
2				E839AY	E839AYB	VOLUME KNOB ASSEMBLY		1
3				E850PM	E850PMB	FMJ MAINS BUTTON		1
4				E919AY	E919AYB	FASCIA ASSEMBLY		1
					HA4V06B	SCREW MACHINE M4x6mm PAN TORX ST STEEL BLACK		
5				HA4V06S		SCREW MACHINE M4x6mm PAN TORX ST STEEL NICKEL	COVER TO CHASSIS	4
6	8A016					IEC INLET		1
7	E040AY					REAR PANEL ASSEMBLY		1
8	E041AY					PHONO CAN ASSEMBLY		1
9	E042AY					POWER CAN ASSEMBLY		1
10	E800RS					MAINS IEC LEAD		1
11	E806PK					POLY BAG VENTILATED 415x535MM 350 GAUGE	TO PACKAGE UNIT	1
12	E816CH					CHASSIS		1
13	E873MC					DAMPING PLATE	CHASSIS FLOOR	1
14	E877MC					POWER CAN LID		1
15	E879SL					PRODUCT CONFIGURATION CONTROL LABEL	OUTSIDE OF CHASSIS WALL	1
16	E887PM					DiVA POWER BUTTON ADAPTER		1
17	E905PK					PLAIN OUTER CARTON FMJ AV8		1
18	E906PK					INTERNAL PRINTED CARTON FMJ AV8		1
19	E907PK					CARDBOARD PARTITION FOR MAINS LEAD FMJ AV8	INSIDE INTERNAL CARTON	1
20	E908PK					PAIR OF CAPS (TOP AND BOTTOM) FMJ AV8		1
21	E919MC					DIGITAL PCB SHIELD		1
22	E935MC					FOOT (TURNED)		4
23	E936SL					FMJ AV8 CARTON LABEL	ON INNER AND OUTER PACKING CARTON	2
24	E942SL					SHOCK WARNING LABEL	ON TOP OF E877MC	1
25	F219					TWIST LOCK CABLE CLIP	ON TOP OF DIGITAL PCB EMC SHIELD	2
26	F224					BLACK DOME BLANKING PLUG	MM/MC HOLE ON REAR PANEL	1
27	F225					BUMPON FOOT (3M)	STICKS TO RECESS IN FOOT	4
28	F226					EMC GASKET (250mm)	ALONG TOP EDGE OF SUB-PANEL	1
29	H030					18mm M3 MALE-FEMALE PILLAR	ABOVE & BELOW PHASE LOCK LOOP PCB	8
30	H038					38mm M3 FEMALE-FEMALE PILLAR	BETWEEN AUDIO AND VIDEO PCB	5
31	H039					38mm M3 MALE-FEMALE PILLAR	DIGITAL PCB BETWEEN AUDIO AND VIDEO PCB	12
32	H041					22mm M3 MALE-FEMALE PILLAR	BETWEEN VIDEO AND TOP VIDEO PCB	2
33	HA3V06A					SCREW MACHINE M3x6mm PAN TORX STEEL ZINC-PLATE CLEAR		60
34	HA3V10B					SCREW MACHINE M3x10mm PAN TORX-SLOT STEEL ZINC-PLATE BLACK	IEC INLET	2

AV8 General Assembly Parts List

ITEM	230V	115V	100V	SILVER	BLACK	DESCRIPTION	WHERE USED	QTY
35	HA4A12B					SCREW MACHINE M4x12mm PAN SUPA STEEL ZINC-PLATE BLACK	REAR PANEL EARTHING STUD	1
36	HA4V06S					SCREW MACHINE M4x6mm PAN TORX ST STEEL NICKEL	CHASSIS EARTHING STUD	1
37	HE6V06B					SELF-TAPPING N06x6mm PAN TORX-SLOT STEEL ZINC-PLATE BLACK	SUB-PANEL TO CHASSIS THRO' CHASSIS INTO DAMPING PLATE	8
38	HF4V09B					SCREW SELF-TAPPING-SEMS N04x9mm PAN TORX-SLOT STEEL ZINC-PLATE BLACK		62
39	HJ3A00F					NUT NYLOC M3 STEEL ZINC-PLATE CLEAR	IEC INLET	2
40	HJ4A00A					NUT FULL M4 STEEL ZINC-PLATE CLEAR	REAR PANEL EARTH	1
41	HJ4C00D					NUT WAISTED M4 BRASS CLEAR	REAR PANEL EARTH	1
42	HJ9A01E					NUT HALF M9 STEEL ZINC-PLATE CLEAR	VOLUME KNOB	1
43	HL3IB					WASHER INT-SHAKEPROOF M3 STEEL ZINC-PLATE BLACK	IEC INLET SCREWS	2
44	HL4SB					WASHER INT-SHAKEPROOF M4 STEEL ZINC-PLATE BLACK	SIDE OF CHASSIS (1) AND REAR PANEL EARTH (2)	3
45	L816RC					REMOTE CONTROL AV8		1
46	L896AY					AV8 DIGITAL PCB ASSEMBLY		1
47	L897AY					PSU PCB ASSEMBLY	HORIZONTAL & VERTICAL PCB'S	1
48	L898AY					AV8 DISPLAY PCB ASSEMBLY		1
49	L921AY					AV8 AUDIO PCB ASSEMBLY	INCLUDES AUXILIARY SNAP-OFF PCB	1
50	L922AY					AV8 VIDEO PCB ASSEMBLY	INCLUDES SNAP-OFF TOP VIDEO & HEADPHONE PCB	1
51	L922CA					22-WAY FLEX FOIL 100mm	VIDEO - TOP VIDEO PCB AUDIO - DIGITAL	2
52	L923CA					8-WAY AMP CT 120mm	AUDIO – DIGITAL (2) PHASE LOCK LOOP - DIGITAL PCB (1) VIDEO – HORIZ POWER (1)	4
53	L925CA					8-WAY AMP CT 280mm	AUDIO PCB - AUX SNAP-OFF PCB (1) PHASE LOCK LOOP - HORIZ POW PCB (1) DIGITAL – POWER (1)	3
54	L926CA					7-WAY AMP CT 350mm	DIGITAL - HORIZONTAL POWER PCB	1
55	L927CA					6-WAY AMP CT 100mm	AUDIO TO HORIZ POWER	1
56	L928CA					6-WAY AMP CT 600mm	DIGITAL - HORIZONTAL POWER PCB	1
57	L929CA					4-WAY AMP CT 220mm	DIGITAL - VERTICAL POWER PCB	1
58	L930CA					5-WAY AMP CT 250mm	HEADPHONE PCB - AUDIO PCB	1
59	L931CA					30-WAY FLEX FOIL 190mm	VIDEO - DIGITAL PCB DIGITAL - DISPLAY PCB	2
60	L933CA					5-WAY AMP CT 100mm	AUDIO - DIGITAL PHASE LOCK LOOP - DIGITAL PCB	2
61	L939CA					POWER LOOM	IEC INLET	1
62	L948AY					PHASE LOCK LOOP PCB		1

AV8 General Assembly Parts List

ITEM	230V	115V	100V	SILVER	BLACK	DESCRIPTION	WHERE USED	QTY
63	P3020					GRIP-SEAL POLYTHENE BAG 254X356 CLEAR 180 GAUGE	FOR REGISTRATION CARD, ENVELOPE AND HANDBOOK	1
64	SH000					REGISTRATION CARD	IN POLY BAG P3020	1
65	SH000A					ENVELOPE	IN POLY BAG P3020	1
66	SH099					AV8 HANDOOK (MULTI-LANGUAGE)	IN POLY BAG P3020	1
67	SH116					L816RC CR80 REMOTE HANDBOOK		1
68	SH119					REAR PANEL CONNECTOR FITTING INSTRUCTIONS		1
69	SM631					SELLOTAPE	PACKING	0.2m
70	U015					BLANK BAR-CODE LABEL	REAR PANEL (WHERE INDICATED), OUTSIDE WALL OF CHASSIS, REGISTRATION CARD, OUTER CARTON LABEL & INNER CARTON LABEL (WHERE INDICATED), AIWA'S RECORDS.	6

AV8 Phono Card Upgrade General Assembly Parts List

ITEM	230V	115V	100V	SILVER	BLACK	DESCRIPTION	WHERE USED	QTY
1	L870AY					PHONO PCB		1
2	H031					20mm M3 FEMALE-FEMALE PILLARS		3
3	HF4V09B					TORX SCREW NO.4x9m + WASHER	REAR PANEL	1
4	HA3V06A					M3x6mm SCREW	INTO PILLARS	6
5	L925CA					8-WAY AMP CT 240mm		1
6	P2C03					WHITE CARD OUTER SLEEVE		1
7	P1A30					BLUE ACCESSORY CARTON		1
8	P2C02					CARD INSERT FOR PHONO PCB		1
9	E941RS					HANDBOOK AND ADDENDUM ASSEMBLY	PLACE IN INSERT	1
10	E933SL					PHONO LABEL	PLACE ON CARTON	1
11	SM631					SELLOTAPE	FOR OUTER SLEEVE	0.2m
12	P3004					POLY BAG SELF SEAL (6" x 9")	FOR PILLARS, SCREWS & CABLE	1

ARCAM

All parts can be ordered via spares@arcam.co.uk

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